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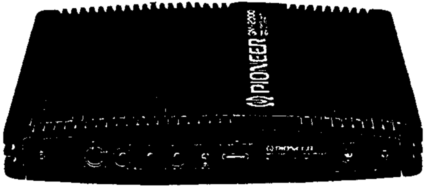
Service Manual

• GM-2000/ES



ORDER NO.
CRT1156

BRIDGEABLE POWER AMPLIFIER

GM-2000 ES EW UC

POWER AMPLIFIER

GM-1000 ES, EW, UC

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SPECIFICATIONS

- GM-2000

Power source .... 14.4 V DC (10.8–15.6 V allowable)
Grounding system .... Negative type
Max. current consumption .... 15 A
Dimensions .... 265 (W) × 48 (H) × 232 (D) mm
Weight .... 3.0 kg (Leads for wiring not included)
Maximum power output .... 100 W × 2/200 W × 1
Continuous power output
.... 60 W × 2/120 W × 1 (at 4 Ω, 1 kHz, 1% THD)
.... 50 W × 2 /100 W × 1
(at 4 Ω, 20–20,000 Hz, 0.015%/0.03% THD)
Load impedance .... 4 Ω (2–8 Ω allowable)
Frequency response .... 10–50,000 Hz (+0dB, −1dB)
Signal-to-noise ratio .... 102 dB (IEC-A network)
Distortion .... 0.005% (at 50 W, 1 kHz)
Low pass filter cut off frequency............... 80 Hz
Low pass filter cut off slope.............. 12dB/octave
Input level .... DIN: 70–500 mV/20k Ω
RCA: 0.2–2 V/7k Ω

- GM-1000

Power source .... 14.4 V DC (10.8–15.6 V allowable)
Grounding system .... Negative type
Max. current consumption .... 10 A
Dimensions .... 265 (W) x 41 (H) x 225 (D) mm
Weight .... 2.7 kg (Cords for wiring not included)
Maximum power output..................... 60 W × 2
Continuous power output
.... 36 W × 2 (at 4 Ω, 1 kHz, 1% THD)
30 W × 2 (at 4 Ω, 20—20,000 Hz, 0.015% THD)
Load impedance .... 4 Ω (4–8 Ω allowable)
Frequency response .... 10–50,000 Hz (+0dB, −1dB)
Signal-to-noise ratio .... 101 dB (IEC-A network)
Distortion..................... 0.005% (at 30 W, 1 kHz)
Input level .... DIN: 70–500 mV/20kΩ
RCA: 0.2–2 V/7kΩ

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

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2020

- **BFC Switch**

Throw SW5 (BFC switch) when <<BEETO>> is generated during reception of AM broadcast (MW, LW).

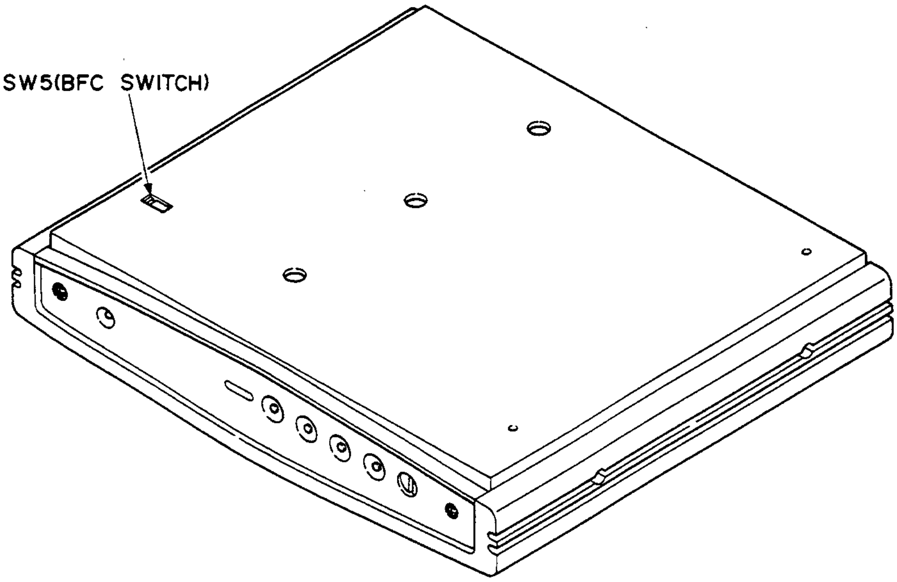
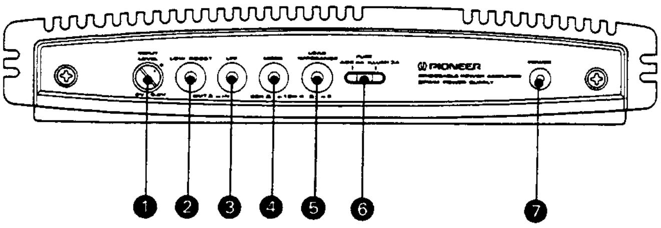


Fig. 1

1. CONTROL AND THEIR USE



GM-2000/ES

❶ Input Level Control
Adjust the input level control to suit the output level of the car stereo used with this amplifier. (See "Input Level Adjustment" on page 2.)

❷ Low Boost Switch
Press this switch to increase the volume of sounds in the low-frequency range if your car audio system does not reproduce enough bass sounds. This is effective when the amplifier is used to drive a sub-woofer.

- If there are no low-frequency sounds in the music you are listening to, or if you are using relatively small speakers, this switch may not make much difference.

❸ Low Pass Filter (LPF) Switch
If this switch is pressed when this amplifier is to be used to drive a sub-woofer, only sounds in the low-frequency range will be output.

❹ Mode Select Switch
Press this switch to use the amplifier as a mono amplifier.

- When the amplifier is used in this way, the speaker leads need to be connected accordingly. (See "Connecting Speaker Leads" on page 2.)

❺ Load Impedance Select Switch
Press this switch when the impedance of the speaker or speakers connected to this amplifier is less than 4 ohms.

❻ Fuse Window
There are a fuse for accessories and a fuse for illumination behind the front grill.

❼ Power Indicator
The power indicator lights when the power is switched on.

2. CONNECTION

Connect the components correctly as shown in the diagram.

- Test-connect all components before securing them into place. Test-operate your entire car stereo system to ensure that there are no faulty wiring connections between this unit and the rest of your car stereo system.
- The input selector of this amplifier functions automatically. Therefore, the amplifier may be used with either a Pioneer car stereo with DIN sockets or a car stereo with RCA pin jacks. For information about connecting a stereo, see the section entitled "When combined with a car stereo with DIN sockets" or that entitled "When combined with a car stereo with RCA pin jacks".
- When two channels (stereo) are used, the speakers should have a minimum rating of 100 W or more. When a single channel (mono) is used, the speaker should have a minimum rating of 200 W or more. If a speaker whose rating is below that recommended is used, the speaker may be damaged. The impedance of the speakers should be between 2 and 8 ohms.
- For detailed information concerning connections between different components and this unit consult their respective instruction manuals and follow those recommendations precisely.
- When wiring connecting leads into place secure them with clampers and adhesive electrician's tape. Additionally, to prevent any damage to the insulative coating of the connecting leads, protect them with adhesive electrician's tape wherever they may come into contact with any sharp edges.
- Wire all connecting leads so that they stay well clear of high-temperature areas such as the heater exhaust port.
- To operate the amplifier and car stereo properly, install the continuous power supply lead (orange) and the accessory power lead (red) correctly. If the leads are not installed correctly or are not connected at all, the amplifier and car stereo will not work.
- The supplied speaker lead with green stripes is not used for a single channel (mono) arrangement; keep it in case you need it in future.
- To use a car stereo with DIN sockets, use the optional component extension cable.

Input Level Adjustment

The input level adjustment knob is factory set as shown in Fig. 2. When a car stereo with DIN sockets is connected, adjust the input level as shown in Fig. 3. If the volume is insufficient even when the car stereo volume is increased, adjust the input level adjustment knob as shown in Fig. 3.

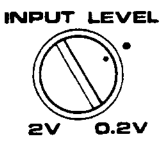


Fig. 2

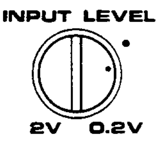


Fig. 3

Connecting Leads (Supplied)

Connecting Speaker Leads

- This amplifier has a mode select switch to select two-channel output (stereo) or one-channel output (mono). The speaker leads must be connected to suit the mode selected. Connect the speaker leads to the output terminals of the amplifier as shown in Fig. 4 and 5, paying attention to the polarities (+ and –) and lead colors.

When two channels (stereo) are used

- Set the mode select switch to the 2CH position.

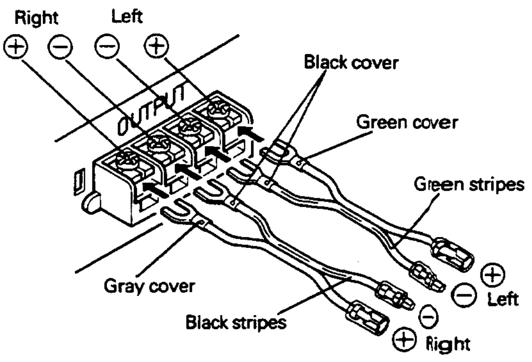


Fig. 4

When one channel (mono) is used

- Set the mode select switch to the 1CH position.
- The speaker lead with green stripes is not used; keep it in case you need it in future.

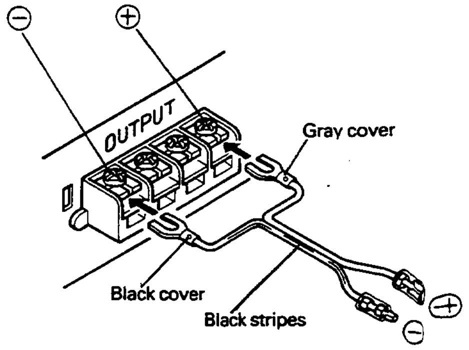


Fig. 5

Connecting the Continuous Power Supply Lead (Orange)

- Route the continuous power supply lead from the engine compartment to the passenger compartment and connect it to the amplifier. To prevent short-circuits, make sure you connect all the other leads first, then connect the end of the continuous power supply lead to the positive (+) terminal of the battery.

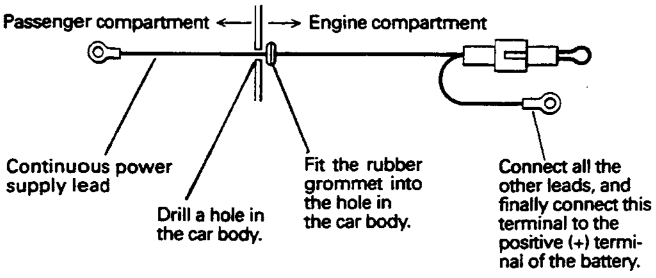

Passenger compartment ←
→ Engine compartment
Continuous power supply lead
Drill a hole in the car body.
Fit the rubber grommet into the hole in the car body.
Connect all the other leads, and finally connect this terminal to the positive (+) terminal of the battery.

Fig. 6

Procedure for Connecting Speaker Leads

1. Loosen the four output terminal screws at the rear of the amplifier in the middle.
2. Insert each speaker lead terminal into an output terminal according to the selected mode. (Fig. 7)
3. Tighten each output terminal screw.
4. Fit the large terminal cover. (Fig. 8)

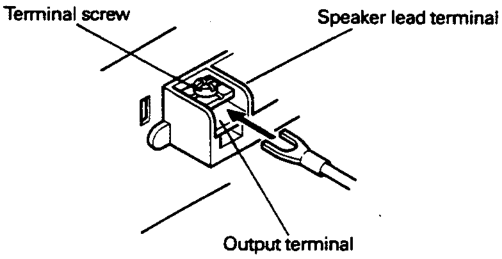
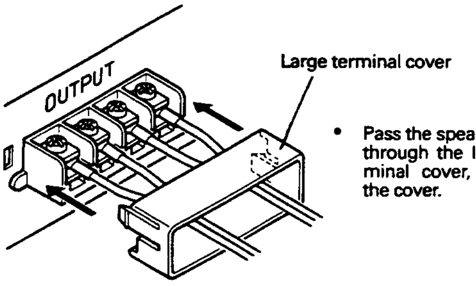

Terminal screw
Speaker lead terminal
Output terminal

Fig. 7


OUTPUT
Large terminal cover

- Pass the speaker leads through the large terminal cover, then fit the cover.

Fig. 8

Procedure for Connecting Continuous Power Supply Lead (Orange) and Grounding Lead (Black)

1. Pass the continuous power supply lead (orange) and the grounding lead (black) through the small terminal cover. (Fig. 9)
2. Remove the screws of the continuous power supply terminal and the grounding terminal at the rear of the amplifier on the left.
3. Replace the screws removed in step 2 in the terminals and tighten them. (Fig. 10)
4. Fit the small terminal cover. (Fig. 11)

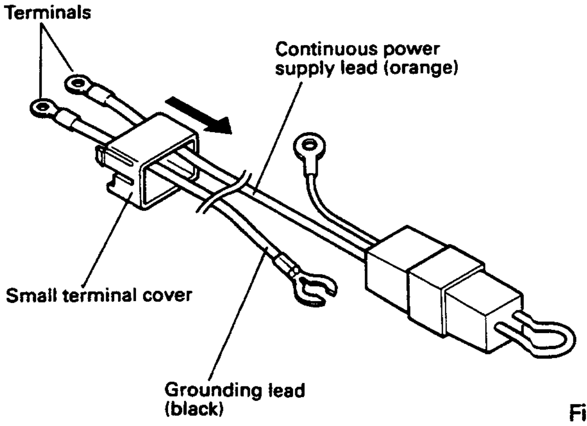

Terminals
Continuous power supply lead (orange)
Small terminal cover
Grounding lead (black)

Fig. 9

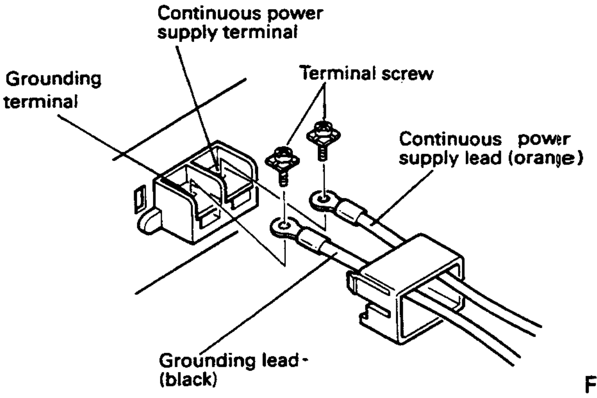

Continuous power supply terminal
Grounding terminal
Terminal screw
Continuous power supply lead (orange)
Grounding lead (black)

Fig. 10

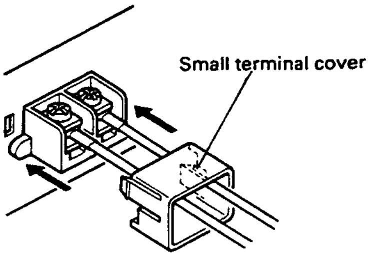
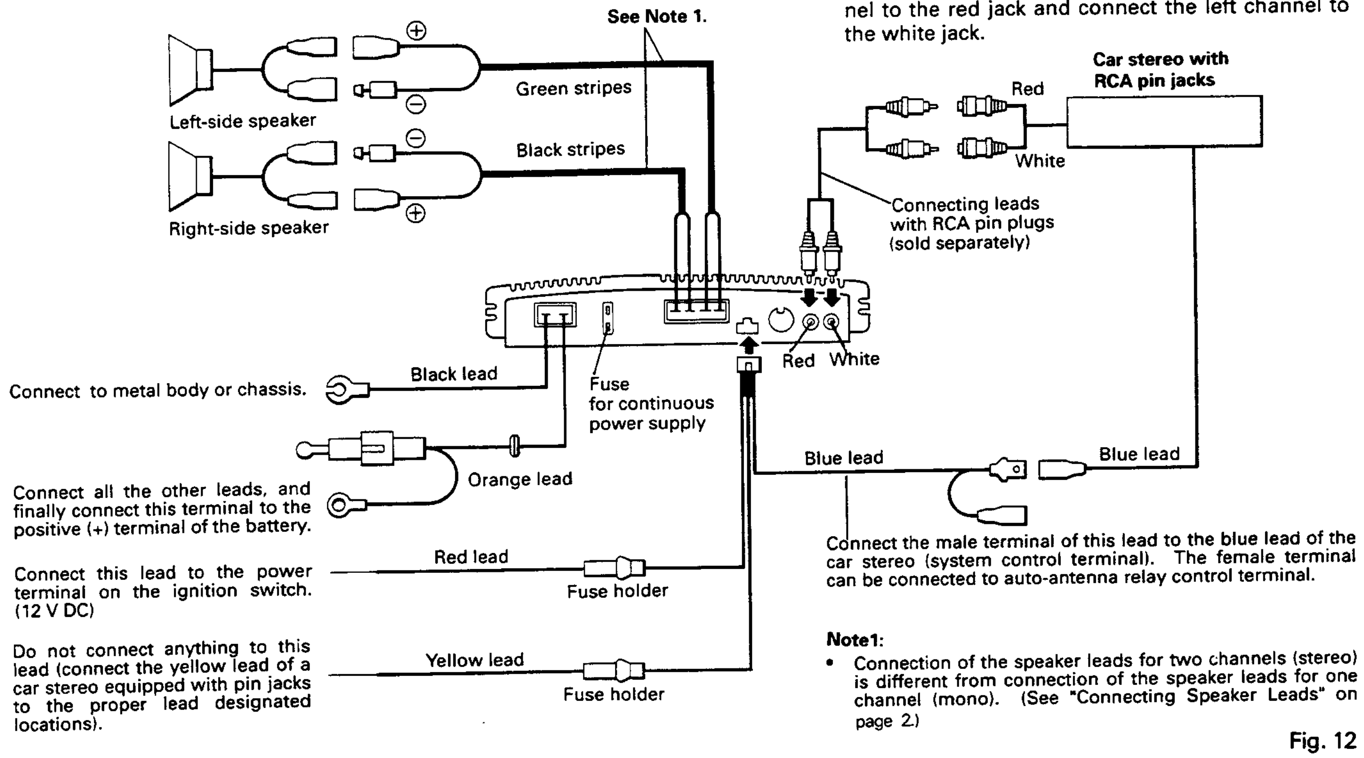

Small terminal cover

Fig. 11

When Combined with a Car Stereo with RCA Pin Jacks

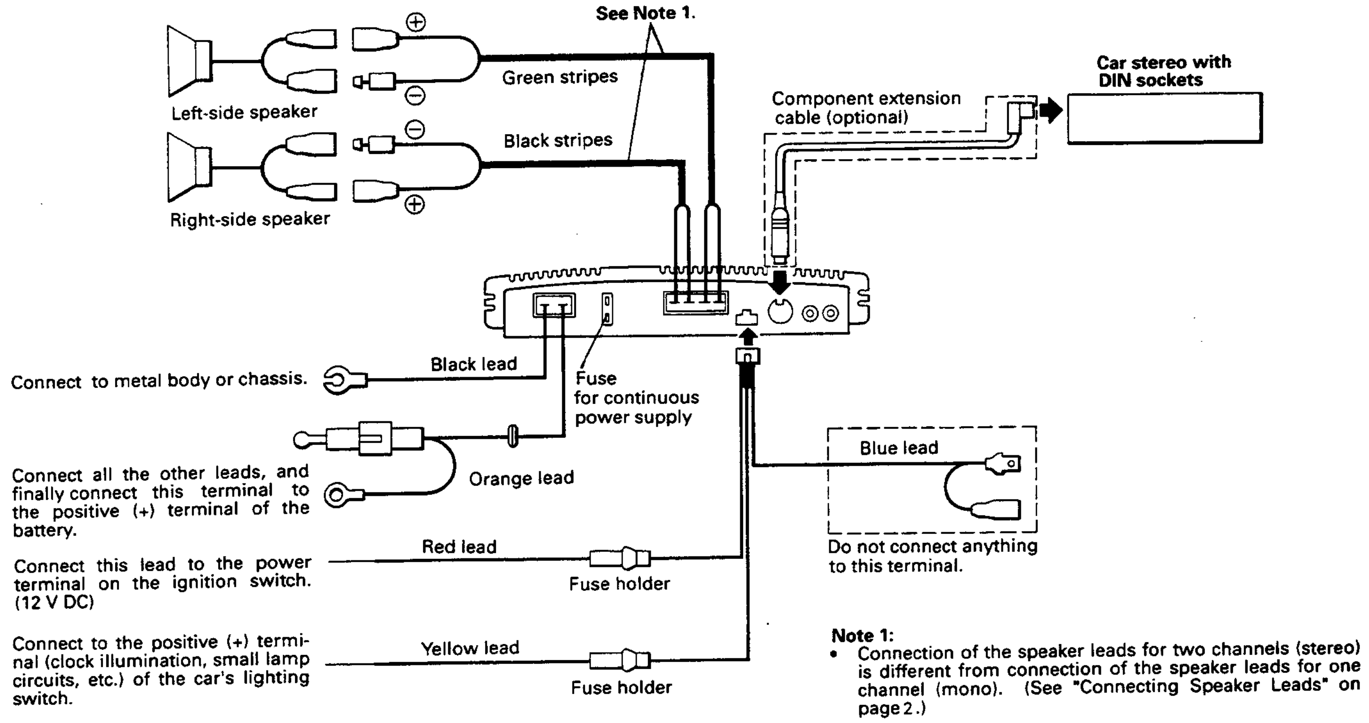
- When connecting connecting leads with RCA pin plugs (sold separately) to the auxiliary input jacks (red and white) of this unit, connect the right channel to the red jack and connect the left channel to the white jack.


See Note 1.
Left-side speaker
Right-side speaker
Green stripes
Black stripes
Car stereo with RCA pin jacks
Red
White
Connecting leads with RCA pin plugs (sold separately)
Red
White
Connect to metal body or chassis.
Black lead
Fuse for continuous power supply
Orange lead
Connect all the other leads, and finally connect this terminal to the positive (+) terminal of the battery.
Blue lead
Blue lead
Connect the male terminal of this lead to the blue lead of the car stereo (system control terminal). The female terminal can be connected to auto-antenna relay control terminal.
Red lead
Connect this lead to the power terminal on the ignition switch. (12 V DC)
Fuse holder
Yellow lead
Do not connect anything to this lead (connect the yellow lead of a car stereo equipped with pin jacks to the proper lead designated locations).
Fuse holder

Note1:
- Connection of the speaker leads for two channels (stereo) is different from connection of the speaker leads for one channel (mono). (See "Connecting Speaker Leads" on page 2.)

Fig. 12

When Combined with a Car Stereo with DIN sockets


See Note 1.
Left-side speaker
Right-side speaker
Green stripes
Black stripes
Car stereo with DIN sockets
Component extension cable (optional)
Connect to metal body or chassis.
Black lead
Fuse for continuous power supply
Orange lead
Connect all the other leads, and finally connect this terminal to the positive (+) terminal of the battery.
Blue lead
Do not connect anything to this terminal.
Red lead
Connect this lead to the power terminal on the ignition switch. (12 V DC)
Fuse holder
Yellow lead
Connect to the positive (+) terminal (clock illumination, small lamp circuits, etc.) of the car's lighting switch.
Fuse holder

Note 1:
- Connection of the speaker leads for two channels (stereo) is different from connection of the speaker leads for one channel (mono). (See "Connecting Speaker Leads" on page 2.)

Fig. 13

3. DISASSEMBLY

• Remove the Heat Sink

1. Remove the five screws A and three screws B.
2. Remove the heat sink.

Attention:

Be sure to screw in order of ①, ② and ③ when installing the heat sink.

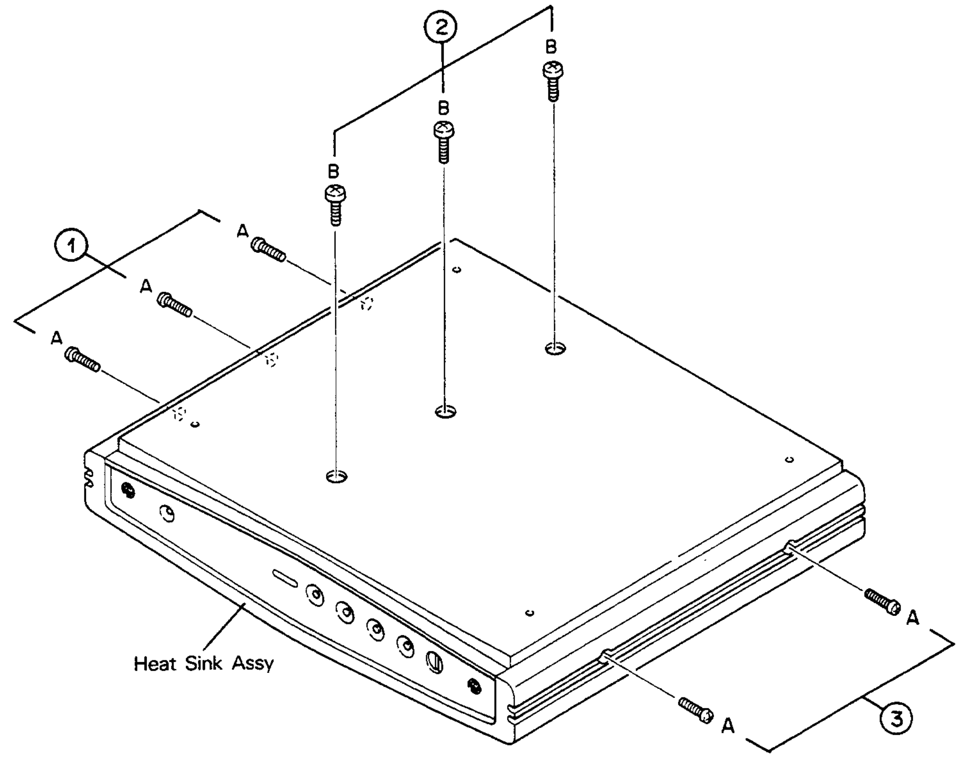

②
B
B
B
①
A
A
A
Heat Sink Assy
A
A
③

Fig. 14

• Remove the Main Unit

1. Remove the four screws D and four screws E.
2. Remove the knob and four buttons.
3. Remove the main unit.

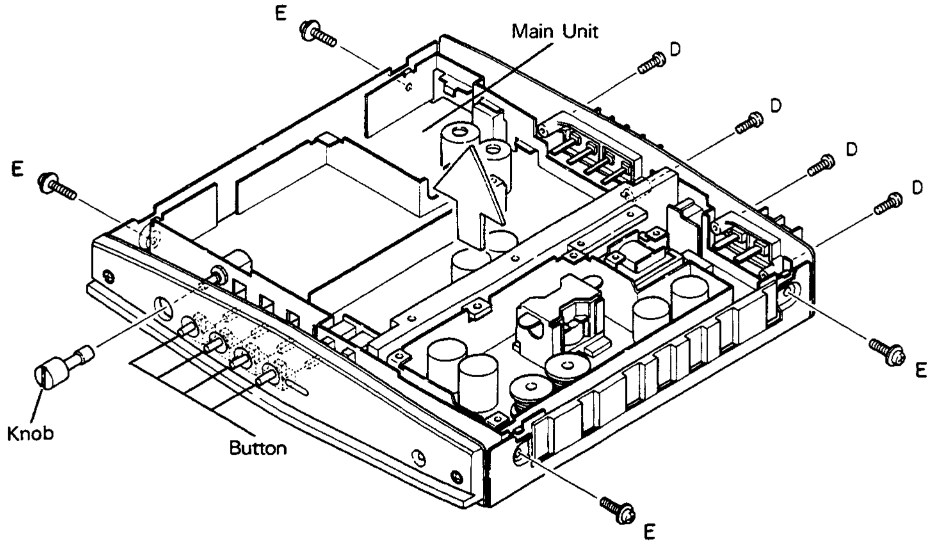
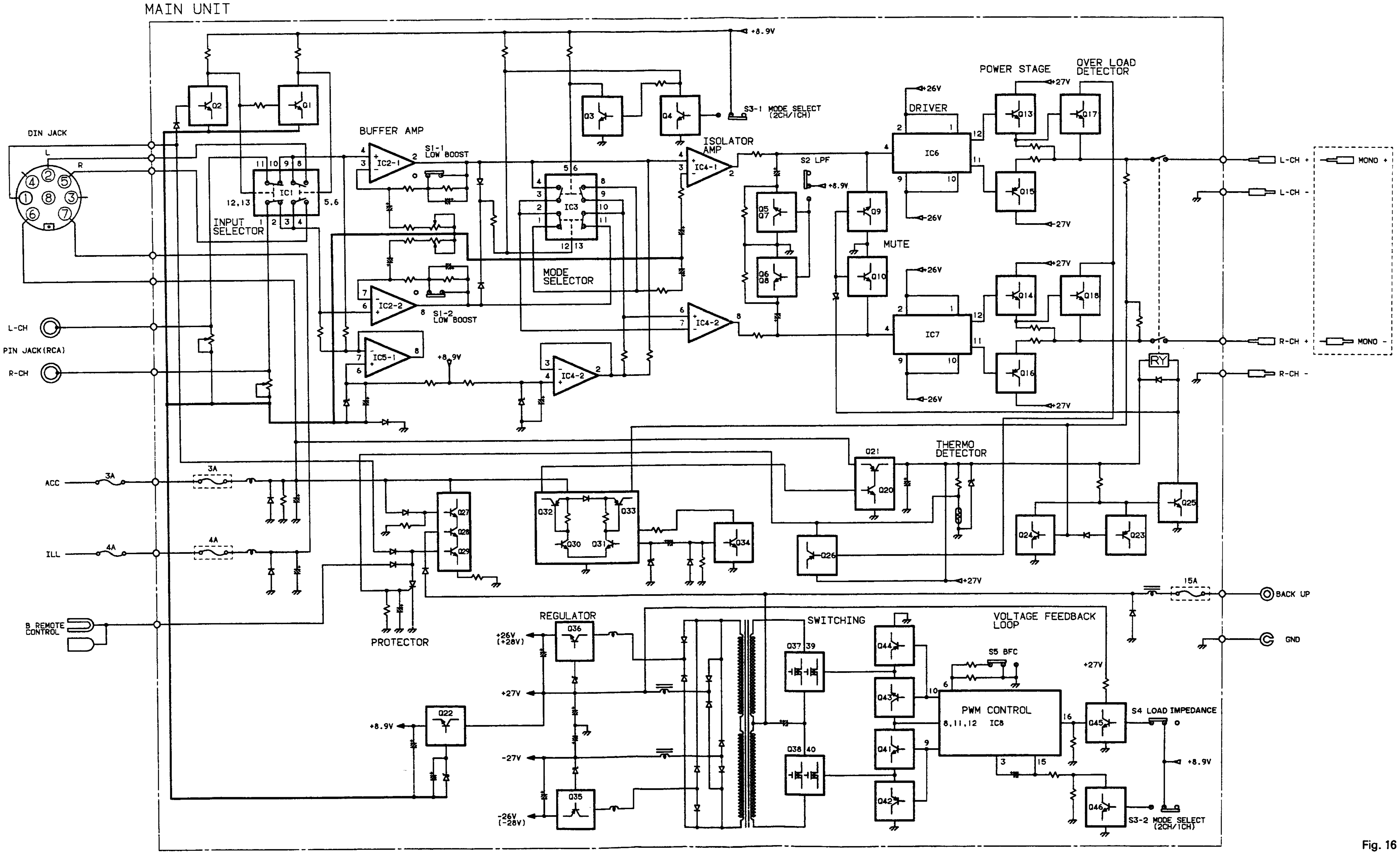

E
Main Unit
D
D
D
D
E
E
E
Knob
Button

Fig. 15

4. CIRCUIT DESCRIPTION

4.1 BLOCK DIAGRAM (GM-2000/ES)

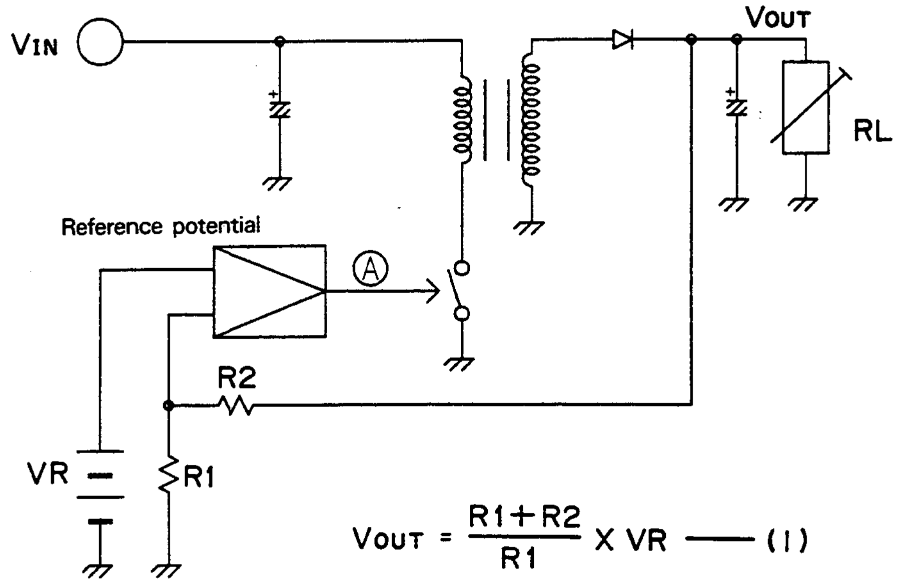

MAIN UNIT
+8.9V
DIN JACK
L
R
④ ② ⑤
① ⑧ ③
⑥ ⑦
Q2
Q1
Q3
Q4
S3-1 MODE SELECT (2CH/1CH)
BUFFER AMP
IC2-1
S1-1 LOW BOOST
IC1
12,13
5,6
INPUT SELECTOR
IC3
MODE SELECTOR
ISOLATOR AMP
IC4-1
S2 LPF
Q5 Q7
Q6 Q8
Q9
MUTE
Q10
DRIVER
IC6
+26V
-26V
POWER STAGE
OVER LOAD DETECTOR
+27V
Q13
Q15
Q17
-27V
Q14
Q16
Q18
IC7
IC2-2
S1-2 LOW BOOST
IC5-1
IC4-2
L-CH
PIN JACK (RCA)
R-CH
L-CH +
L-CH -
R-CH +
R-CH -
MONO +
MONO -
RY
ACC
3A
ILL
4A
B REMOTE CONTROL
Q27
Q28
Q29
PROTECTOR
Q32
Q33
Q30
Q31
Q34
Q21
Q20
THERMO DETECTOR
Q26
Q24
Q23
Q25
15A
BACK UP
GND
REGULATOR
Q36
+26V (+28V)
+27V
-27V
-26V (-28V)
Q22
+8.9V
Q35
SWITCHING
Q37 39
Q38 40
Q44
Q43
Q41
Q42
VOLTAGE FEEDBACK LOOP
S5 BFC
PWM CONTROL
IC8
8,11,12
Q45
Q46
S4 LOAD IMPEDANCE
S3-2 MODE SELECT (2CH/1CH)

( ) WHEN MAXIMUM POWER OUTPUT

Fig. 16

4.2 PWM (Pulse Width Modulation) POWER SUPPLY

The PWM power supply is a circuit that maintains stable secondary voltage in a DC/DC converter, regardless of the voltage fluctuation and load fluctuation of the primary voltage.
In actual operation, the output voltage (Vout) expressed by formula (1) is maintained at a stable level. Consequently, when load fluctuation or fluctuation of the primary (battery) voltage occurs, the PWM circuit illustrated in Fig. 17-2 and 17-3 to control the pulse width of the gate voltage at A.



$$V_{OUT} = \frac{R1+R2}{R1} \times VR \quad \text{—— (1)}$$

Fig. 17-1

• Waveforms at point A (V: 10V/div, H: 10μS/div)

No signal

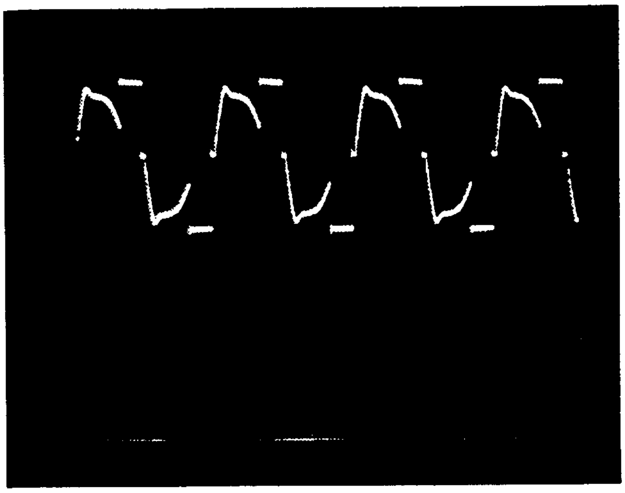


Fig. 17-2

Large output or drop in input voltage (VIN)

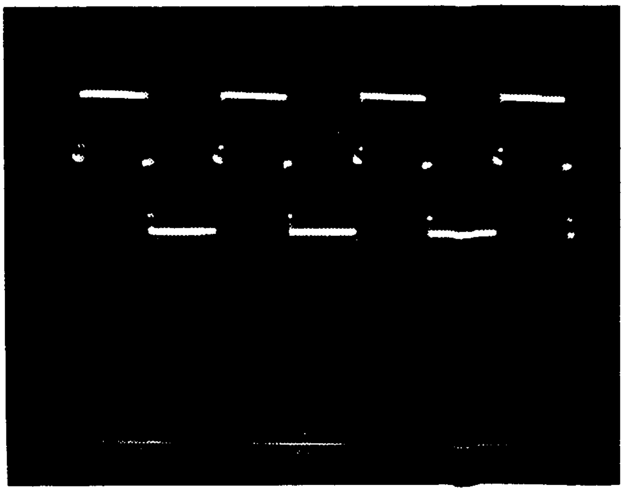


Fig. 17-3

5. ADJUSTMENT

• Connection Diagram

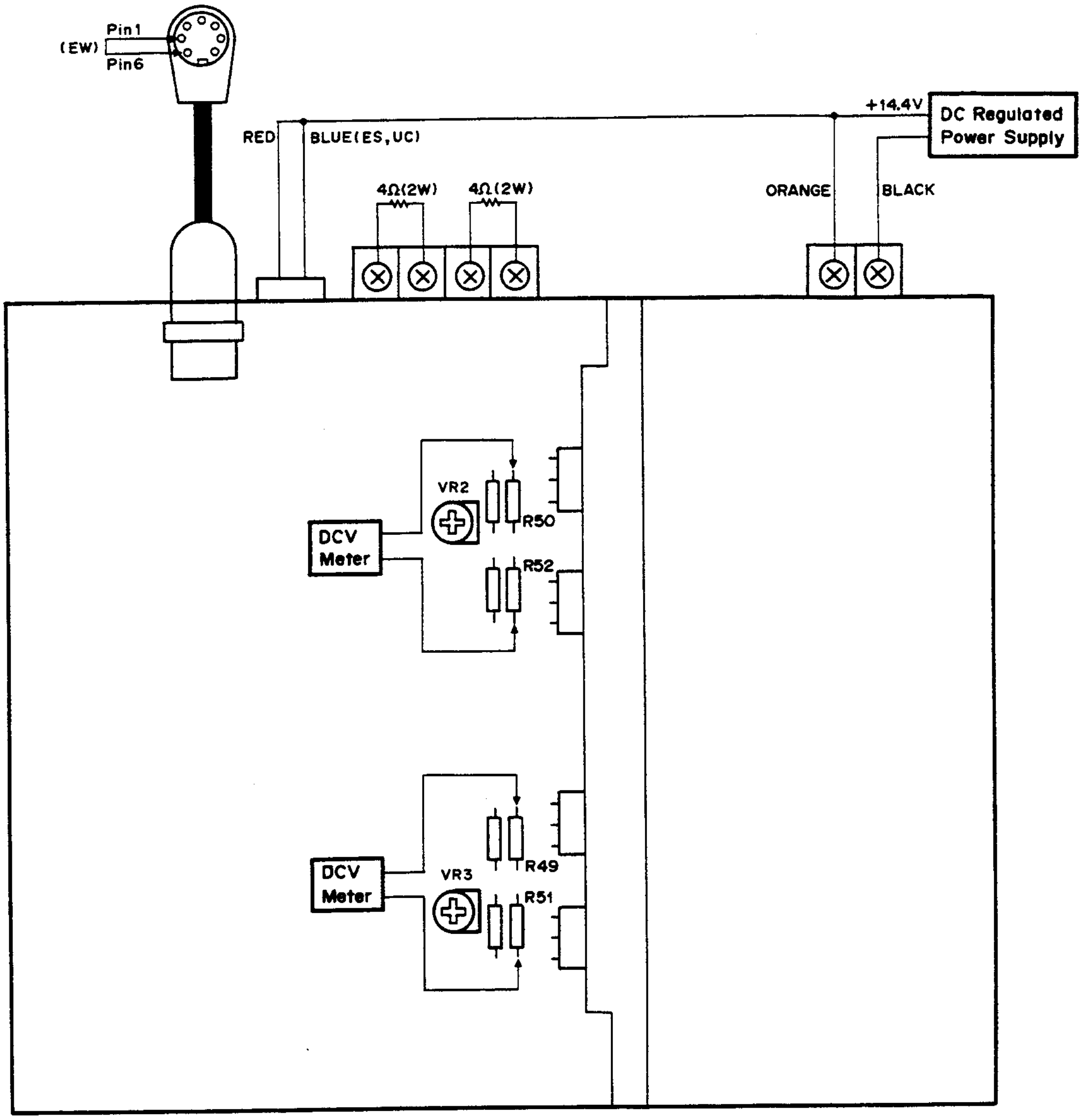

Pin1
(EW)
Pin6
RED
BLUE(ES,UC)
+14.4V
DC Regulated Power Supply
4Ω(2W)
4Ω(2W)
ORANGE
BLACK
VR2
R50
DCV Meter
R52
R49
DCV Meter
VR3
R51

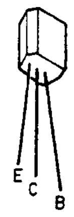
Fig. 18

5.1 IDLE CURRENT ADJUSTMENT

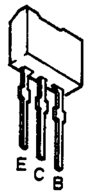
No.	Adjusting Point	Adjustment Method
1		Rotate VR2 and VR3 counterclockwise. Turn the power on, and wait about 30 minutes.
2	VR2,3	DC V Meter: 6.6 mV + 1.1 mV − 2.2 mV (GM-2000) DC V Meter: 13.2 mV + 2.2 mV − 4.4 mV (GM-1000)

- **ICs and Transistors**

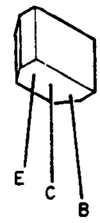
2SA1048
2SC1740S
2SC2458
2SC3113



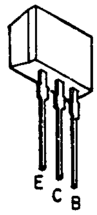
2SB1240
2SD1862



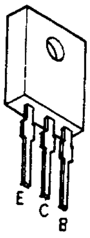
2SA933S
2SD1768S



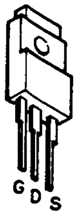
2SC3623A
2SC2783



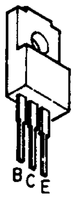
2SC1568



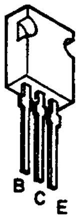
2SK817



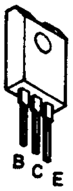
2SB946
2SD1271



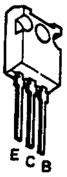
2SB1357
2SD2037



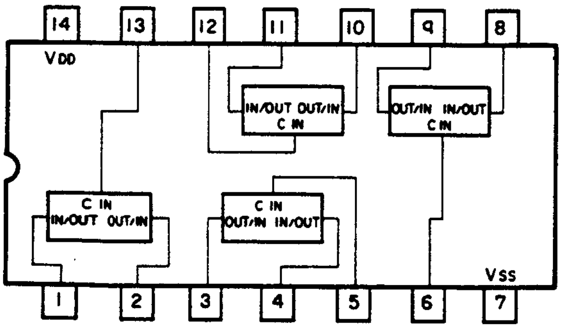
2SB1154
2SD1705



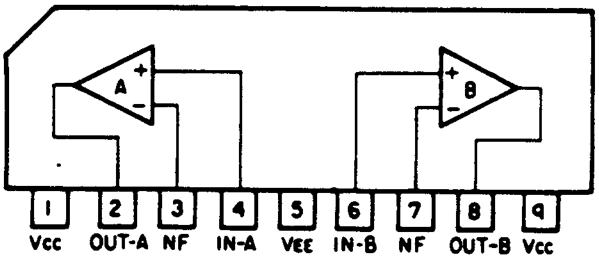
2SA1359
2SC3422



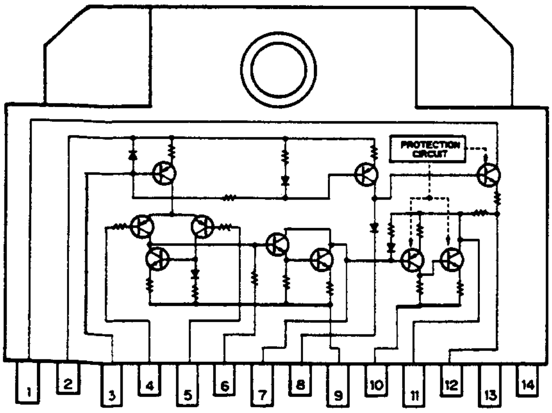
TC4066BP


14
13
12
11
10
9
8
VDD
IN/OUT OUT/IN
C IN
OUT/IN IN/OUT
C IN
C IN
IN/OUT OUT/IN
C IN
OUT/IN IN/OUT
VSS
1
2
3
4
5
6
7

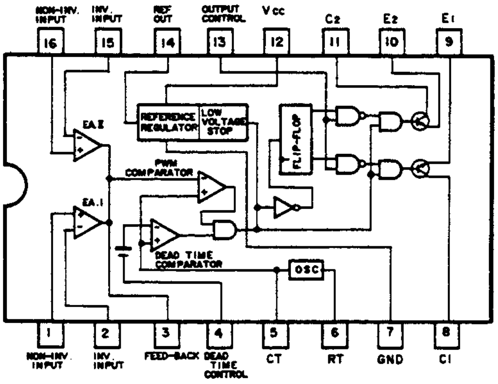
NJM2068S
NJM4558S


A
B
1 Vcc
2 OUT-A
3 NF
4 IN-A
5 VEE
6 IN-B
7 NF
8 OUT-B
9 Vcc

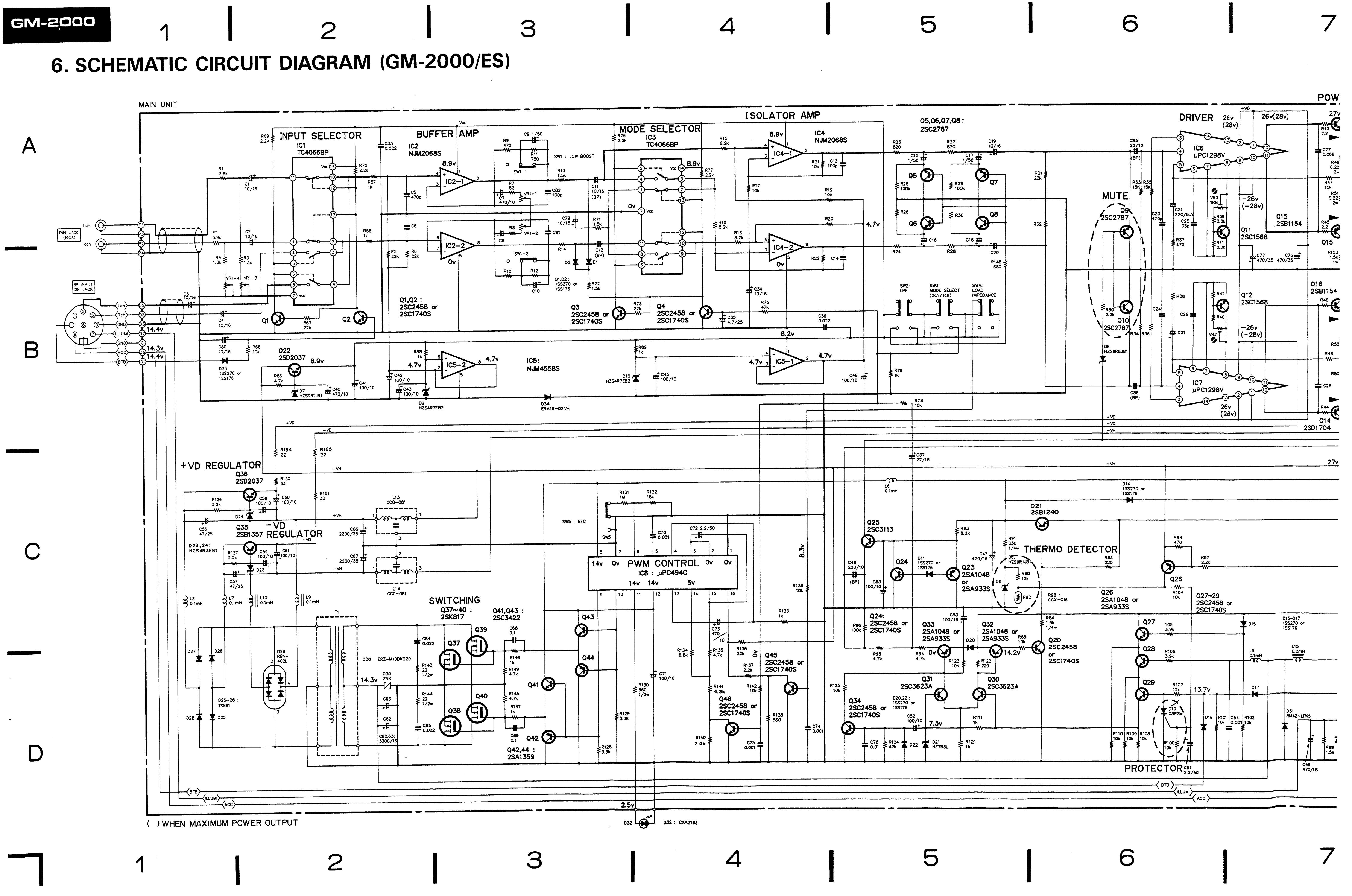
μPC1298V

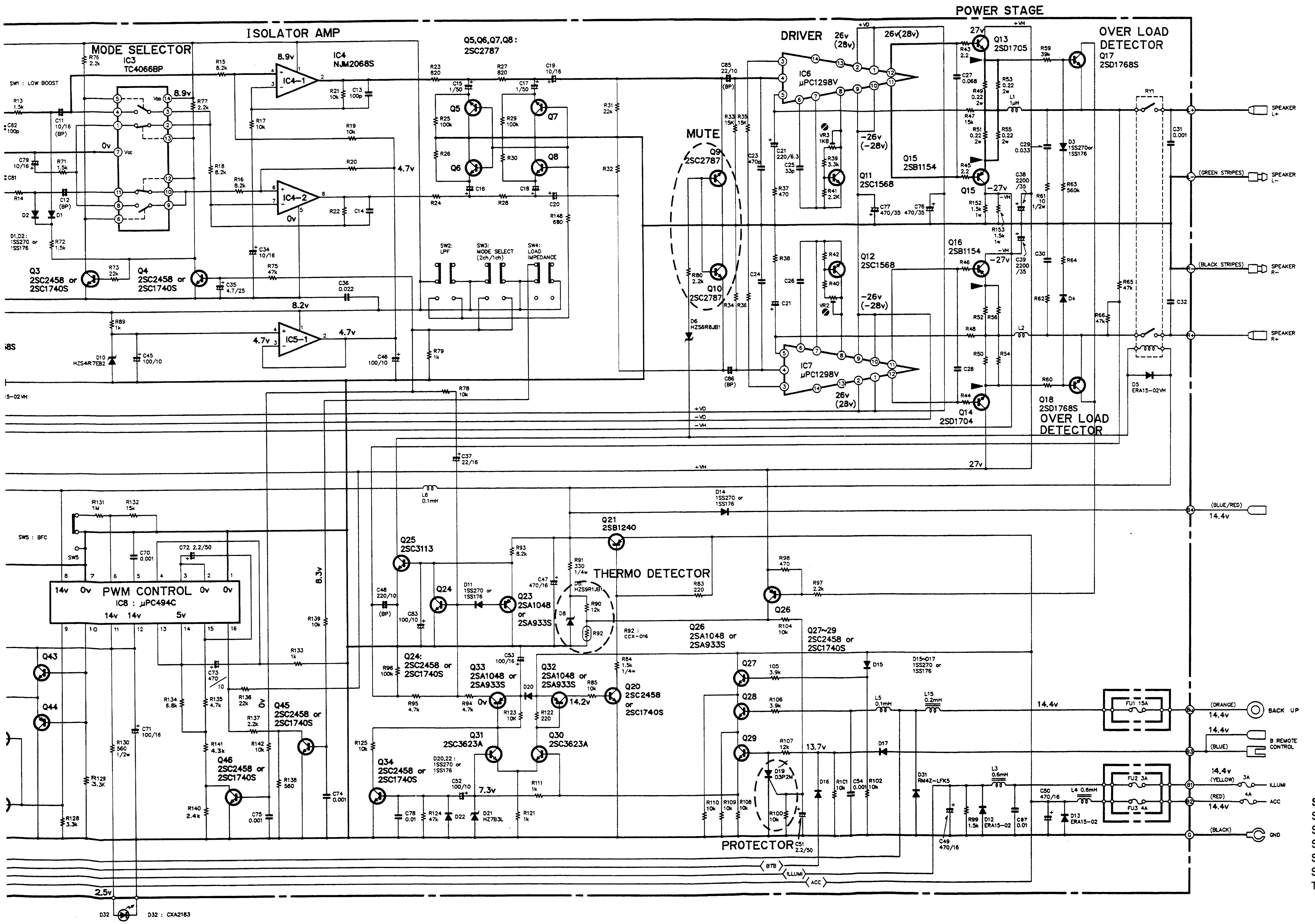

PROTECTION CIRCUIT
1
2
3
4
5
6
7
8
9
10
11
12
13
14

μPC494C


NON-INV. INPUT 16
INV. INPUT 15
REF OUT 14
OUTPUT CONTROL 13
Vcc 12
C2 11
E2 10
E1 9
EA 2
REFERENCE REGULATOR
LOW VOLTAGE STOP
FLIP-FLOP
PWM COMPARATOR
EA 1
DEAD TIME COMPARATOR
OSC
1 NON-INV. INPUT
2 INV. INPUT
3 FEED-BACK
4 DEAD TIME CONTROL
5 CT
6 RT
7 GND
8 C1

6. SCHEMATIC CIRCUIT DIAGRAM (GM-2000/ES)


1
2
3
4
5
6
7
A
B
C
D
MAIN UNIT
INPUT SELECTOR
IC1 TC4066BP
BUFFER AMP
IC2 NJM2068S
MODE SELECTOR
IC3 TC4066BP
ISOLATOR AMP
IC4 NJM2068S
Q5,Q6,Q7,Q8 : 2SC2787
DRIVER
IC6 μPC1298V
IC7 μPC1298V
MUTE
Q9 2SC2787
Q10 2SC2787
Q11 2SC1568
Q12 2SC1568
Q15 2SB1154
Q16 2SB1154
Q14 2SD1704
POW
PIN JACK (RCA)
BP INPUT DIN JACK
Lch
Rch
SW1 : LOW BOOST
SW2: LPF
SW3: MODE SELECT (2ch/1ch)
SW4: LOAD IMPEDANCE
SW5 : BFC
Q1,Q2 : 2SC2458 or 2SC1740S
Q3 2SC2458 or 2SC1740S
Q4 2SC2458 or 2SC1740S
Q22 2SD2037
IC5: NJM4558S
+VD REGULATOR
Q36 2SD2037
-VD REGULATOR
Q35 2SB1357
D23,24: HZS4R3EB1
L13 CCG-081
L14 CCG-081
PWM CONTROL
IC8 : μPC494C
SWITCHING
Q37~40 : 2SK817
Q41,Q43 : 2SC3422
Q42,44 : 2SA1359
D30 : ERZ-M10DK220
D29 RBV-402L
D25~28 : 1SS81
T1
THERMO DETECTOR
Q21 2SB1240
Q25 2SC3113
Q23 2SA1048 or 2SA933S
Q24: 2SC2458 or 2SC1740S
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
Q20 2SC2458 or 2SC1740S
Q30 2SC3623A
Q31 2SC3623A
Q32 2SA1048 or 2SA933S
Q33 2SA1048 or 2SA933S
Q34 2SC2458 or 2SC1740S
Q45 2SC2458 or 2SC1740S
Q46 2SC2458 or 2SC1740S
R92 : CCX-016
D15~D17 1SS270 or 1SS176
D31 RM4Z-LFK5
PROTECTOR
D32 : CXA2183
( ) WHEN MAXIMUM POWER OUTPUT



4
5
6
7
8
9
A
B
C
D
POWER STAGE
ISOLATOR AMP
MODE SELECTOR
IC3 TC4066BP
IC4 NJM2068S
IC4-1
IC4-2
IC5-1
Q5,Q6,Q7,Q8 : 2SC2787
DRIVER
IC6 µPC1298V
IC7 µPC1298V
MUTE
Q9 2SC2787
Q10 2SC2787
Q11 2SC1568
Q12 2SC1568
Q13 2SD1705
Q14 2SD1704
Q15 2SB1154
Q16 2SB1154
OVER LOAD DETECTOR
Q17 2SD1768S
Q18 2SD1768S
Q3 2SC2458 or 2SC1740S
Q4 2SC2458 or 2SC1740S
SW1 : LOW BOOST
SW2: LPF
SW3: MODE SELECT (2ch/1ch)
SW4: LOAD IMPEDANCE
SW5 : BFC
PWM CONTROL
IC8 : µPC494C
THERMO DETECTOR
PROTECTOR
Q20 2SC2458 or 2SC1740S
Q21 2SB1240
Q23 2SA1048 or 2SA933S
Q24: 2SC2458 or 2SC1740S
Q25 2SC3113
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
Q30 2SC3623A
Q31 2SC3623A
Q32 2SA1048 or 2SA933S
Q33 2SA1048 or 2SA933S
Q34 2SC2458 or 2SC1740S
Q45 2SC2458 or 2SC1740S
Q46 2SC2458 or 2SC1740S
D32 : CXA2183
SPEAKER L+
(GREEN STRIPES) SPEAKER L−
(BLACK STRIPES) SPEAKER R−
SPEAKER R+
(BLUE/RED) 14.4v
(ORANGE) 14.4v BACK UP
14.4v (BLUE) B REMOTE CONTROL
14.4v (YELLOW) 3A ILLUMI
(RED) 14.4v 4A ACC
(BLACK) GND
FU1 15A
FU2 3A
FU3 4A
BTB
ILLUMI
ACC

SWITCHES

SW1: LOW BOOST SWITCH .... ON-OFF

SW2: LPF SWITCH .... ON-OFF

SW3: MODE SELECT SWITCH 1ch-2ch

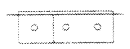
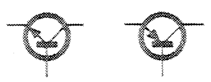
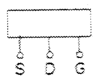
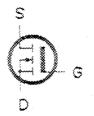
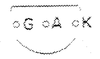
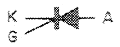
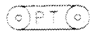
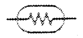
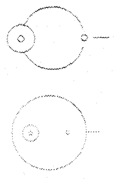
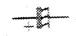
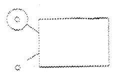
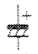
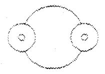
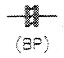
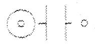
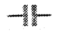
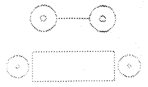
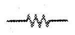
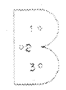
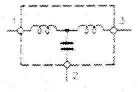
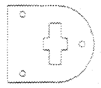
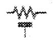
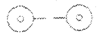
SW4: LOAD IMPEDANCE SWITCH 2Ω-4Ω

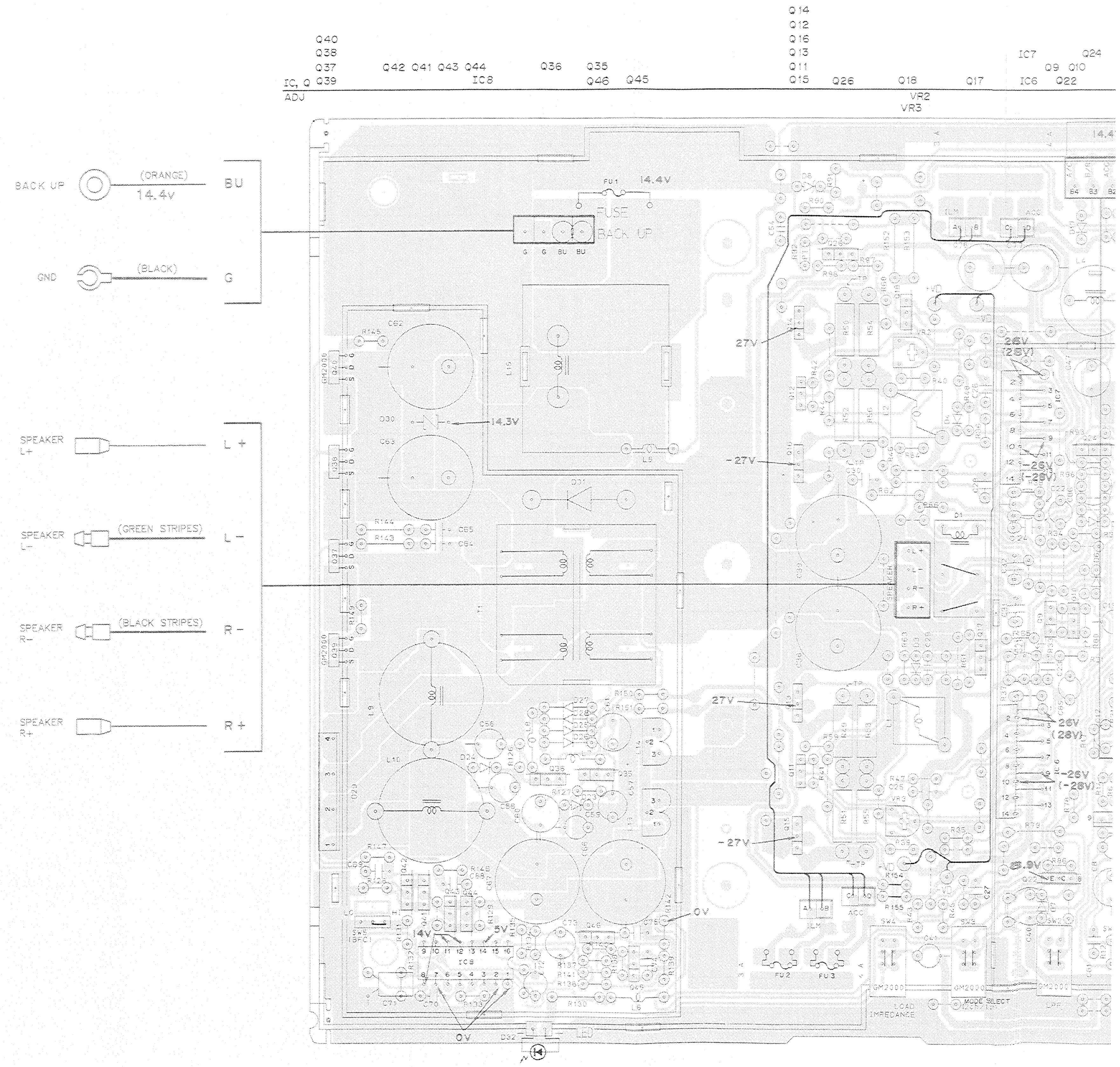
SW5: BFC SWITCH .... LOW-HIGH

The underlined indicates the switch position.

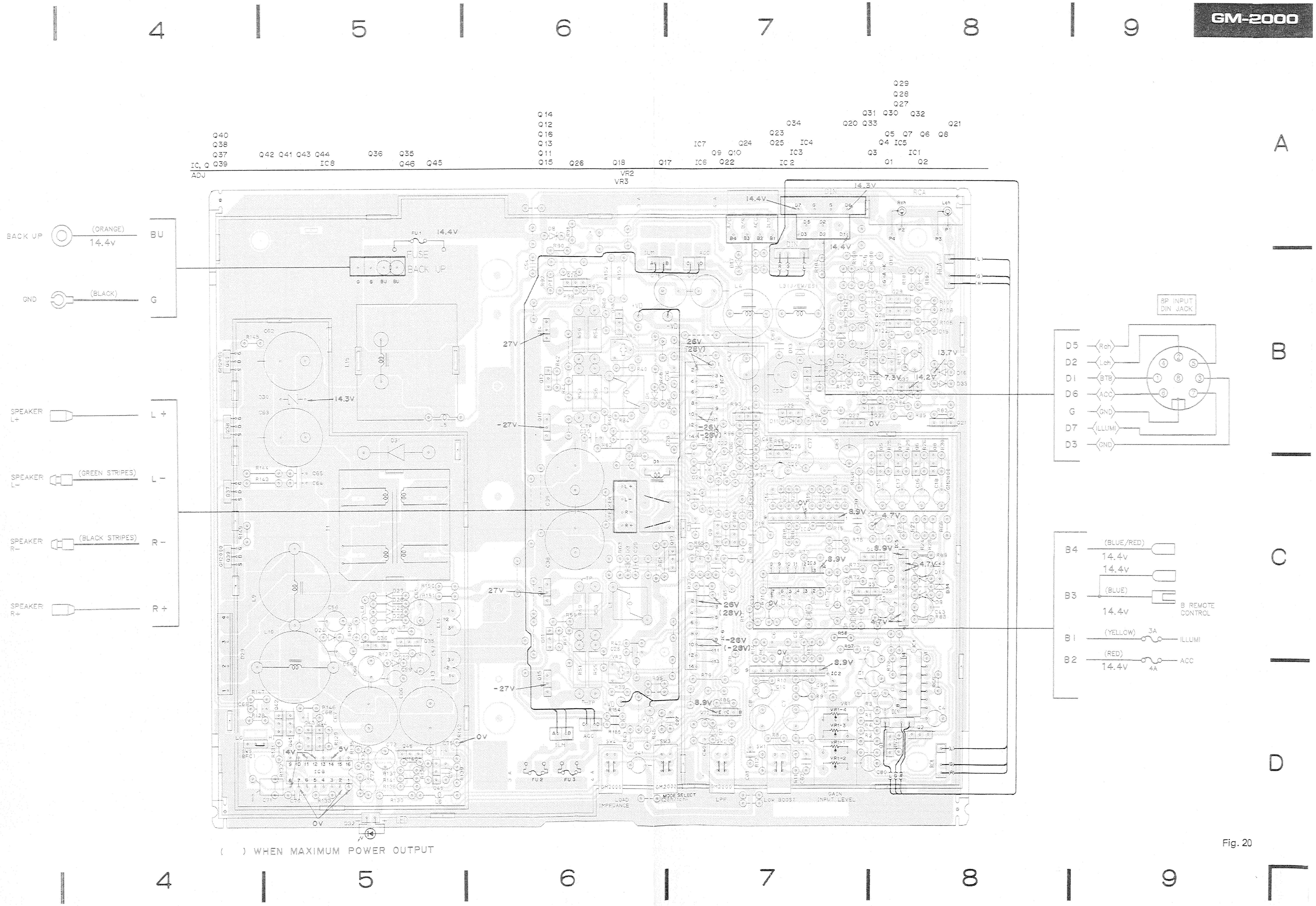
Fig. 19

7. CONNECTION DIAGRAM (GM-2000/ES)

Pattern symbol	Schematic symbol	Representation	Remarks
		Transistor	Transistor E comes in square ⊡ , then to left C and B follow unless otherwise indicated.
		FET	
		Thyristor	
		Posistor	
		Electrolytic capacitor (polarized)	In case of polarized electrolytic capacitor, terminal marked ◎ indicates +.
		Electrolytic capacitor (polarized)	
		Electrolytic capacitor (nonpolarized)	
		Capacitor	
		Resistor	
		Filter	
		Semi-fixed resistor	
		Jumper	


BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
SPEAKER L+
L +
SPEAKER L−
(GREEN STRIPES)
L −
SPEAKER R−
(BLACK STRIPES)
R −
SPEAKER R+
R +
IC, Q
ADJ
Q40 Q38 Q37 Q39
Q42 Q41 Q43 Q44
IC8
Q36
Q35 Q46
Q45
Q14 Q12 Q16 Q13 Q11 Q15
Q26
Q18
VR2 VR3
Q17
IC7 IC6
Q24 Q9 Q10 Q22
FU1 14.4V
FUSE BACK UP
G G BU BU
14.3V
27V
−27V
26V (28V)
−26V (−28V)
6.9V
OV
4V
5V
FU2
FU3
ILM
ACC
GM2000
LOAD IMPEDANCE
MODE SELECT
LPF
D32
LED

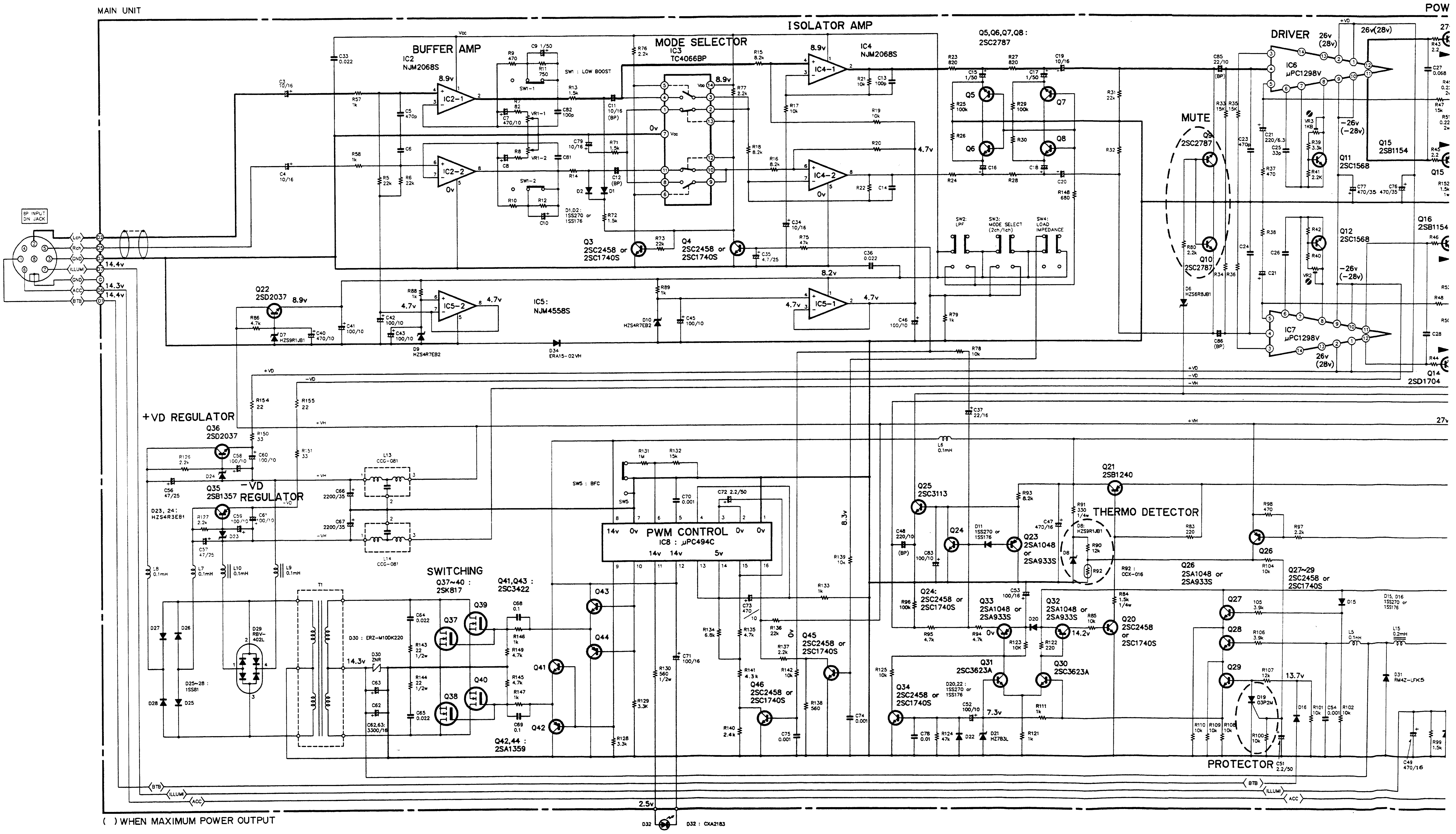
( ) WHEN MAXIMUM POWER OUTPUT

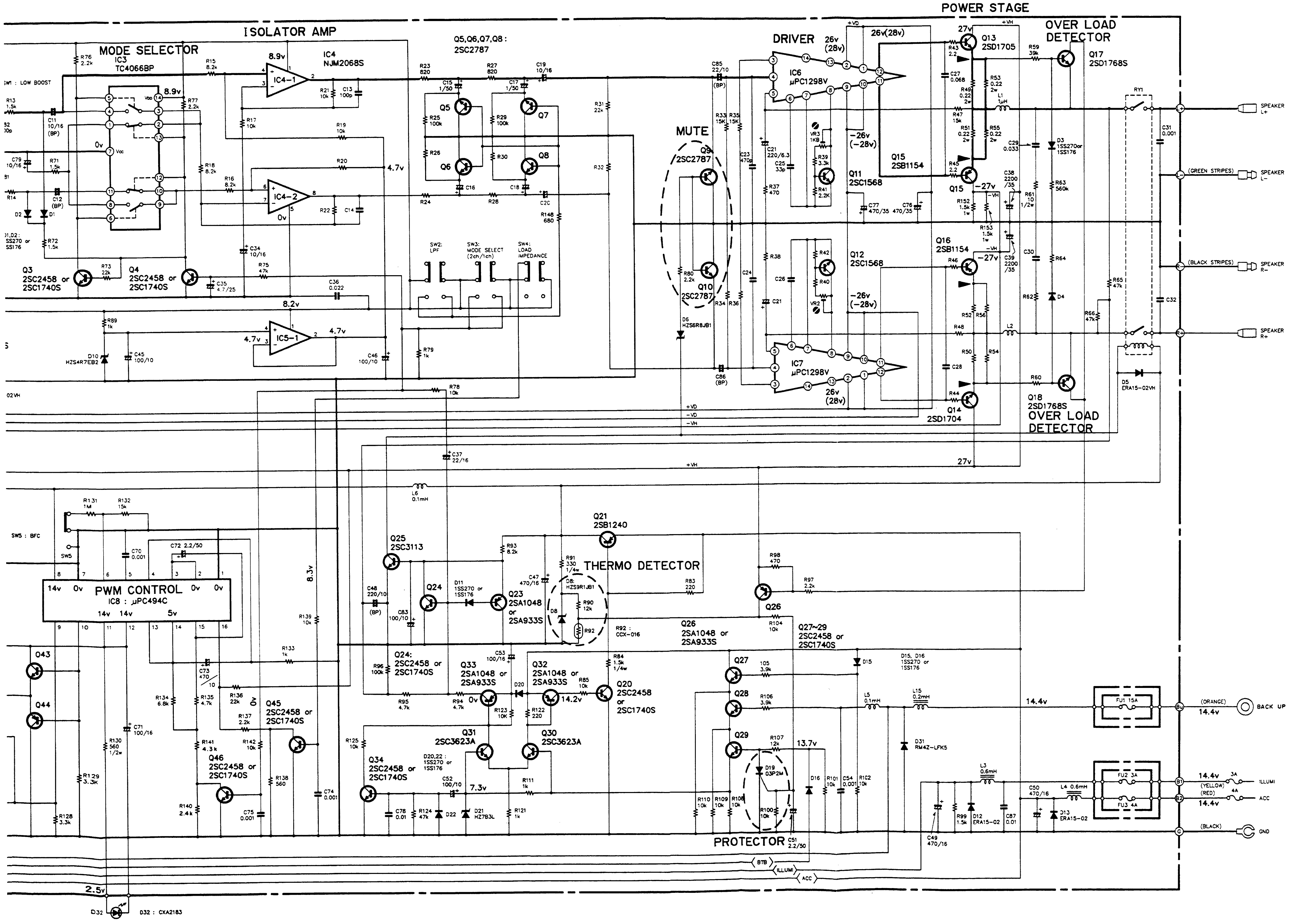

4
5
6
7
8
9
A
B
C
D
IC, Q
ADJ
Q40
Q38
Q37
Q39
Q42 Q41 Q43 Q44
IC8
Q36
Q35
Q46
Q45
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
VR2
VR3
Q17
IC7
IC6
Q9 Q10
Q22
Q24
Q23
Q25
Q34
IC4
IC3
IC2
Q29
Q28
Q27
Q31 Q30 Q32
Q20 Q33
Q21
Q5 Q7 Q6 Q8
Q4 IC5
Q3
IC1
Q1
Q2
BACK UP
(ORANGE)
14.4v
BU
GND
(BLACK)
G
FUSE
BACK UP
14.4V
14.3V
SPEAKER L+
L +
SPEAKER L−
(GREEN STRIPES)
L −
SPEAKER R−
(BLACK STRIPES)
R −
SPEAKER R+
R +
27V
−27V
27V
−27V
26V
(28V)
−26V
(−28V)
26V
(28V)
−26V
(−28V)
8.9V
4.7V
8.9V
4.7V
8.9V
4.7V
8.9V
8.9V
0V
0V
0V
0V
0V
13.7V
7.3V
14.2V
14.4V
14.4V
14.3V
DIN
RCA
Rch
Lch
14V
5V
FU2
FU3
LOAD IMPEDANCE
MODE SELECT
LPF
LOW BOOST
GAIN INPUT LEVEL
8P INPUT DIN JACK
D5
(Rch)
D2
(Lch)
D1
(BTB)
D6
(ACC)
G
(GND)
D7
(ILLUMI)
D3
(GND)
B4
(BLUE/RED)
14.4v
14.4v
B3
(BLUE)
14.4v
B REMOTE CONTROL
B1
(YELLOW)
3A
ILLUMI
B2
(RED)
14.4v
4A
ACC

( ) WHEN MAXIMUM POWER OUTPUT

Fig. 20

8. SCHEMATIC CIRCUIT DIAGRAM (GM-2000/EW)


MAIN UNIT
BUFFER AMP
IC2 NJM2068S
MODE SELECTOR
IC3 TC4066BP
ISOLATOR AMP
IC4 NJM2068S
Q5,Q6,Q7,Q8 : 2SC2787
DRIVER
IC6 μPC1298V
IC7 μPC1298V
MUTE
Q9 2SC2787
Q10 2SC2787
Q11 2SC1568
Q12 2SC1568
Q15 2SB1154
Q16 2SB1154
Q14 2SD1704
SW1 : LOW BOOST
SW2: LPF
SW3: MODE SELECT (2ch/1ch)
SW4: LOAD IMPEDANCE
SW5 : BFC
BP INPUT DIN JACK
Q22 2SD2037
IC5: NJM4558S
D34 ERA15-02VH
+VD REGULATOR
Q36 2SD2037
-VD REGULATOR
Q35 2SB1357
D23, 24: HZS4R3EB1
L13 CCG-081
L14 CCG-081
SWITCHING
Q37~40 : 2SK817
Q41,Q43 : 2SC3422
Q42,44 : 2SA1359
D30 : ERZ-M10DK220
D29 RBV-402L
D25~28 : 1SS81
PWM CONTROL
IC8 : μPC494C
Q3 2SC2458 or 2SC1740S
Q4 2SC2458 or 2SC1740S
Q45 2SC2458 or 2SC1740S
Q46 2SC2458 or 2SC1740S
Q21 2SB1240
Q25 2SC3113
Q24
THERMO DETECTOR
Q23 2SA1048 or 2SA933S
Q24: 2SC2458 or 2SC1740S
Q33 2SA1048 or 2SA933S
Q32 2SA1048 or 2SA933S
Q20 2SC2458 or 2SC1740S
Q31 2SC3623A
Q30 2SC3623A
Q34 2SC2458 or 2SC1740S
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
R92 : CCX-016
D19 03P2M
D31 RM4Z-LFK5
PROTECTOR
D32 : CXA2183
( ) WHEN MAXIMUM POWER OUTPUT


POWER STAGE
ISOLATOR AMP
MODE SELECTOR
IC3 TC4066BP
IC4 NJM2068S
IC4-1
IC4-2
IC5-1
Q5,Q6,Q7,Q8: 2SC2787
DRIVER
IC6 μPC1298V
IC7 μPC1298V
MUTE
Q9 2SC2787
Q10 2SC2787
Q11 2SC1568
Q12 2SC1568
Q13 2SD1705
Q14 2SD1704
Q15 2SB1154
Q16 2SB1154
OVER LOAD DETECTOR
Q17 2SD1768S
Q18 2SD1768S
RY1
SPEAKER L+
SPEAKER L−
SPEAKER R−
SPEAKER R+
(GREEN STRIPES)
(BLACK STRIPES)
Q3 2SC2458 or 2SC1740S
Q4 2SC2458 or 2SC1740S
SW2: LPF
SW3: MODE SELECT (2ch/1ch)
SW4: LOAD IMPEDANCE
SW1 : LOW BOOST
SW5 : BFC
PWM CONTROL
IC8 : μPC494C
Q25 2SC3113
Q24
Q23 2SA1048 or 2SA933S
Q21 2SB1240
THERMO DETECTOR
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
Q24: 2SC2458 or 2SC1740S
Q33 2SA1048 or 2SA933S
Q32 2SA1048 or 2SA933S
Q20 2SC2458 or 2SC1740S
Q31 2SC3623A
Q30 2SC3623A
Q34 2SC2458 or 2SC1740S
Q45 2SC2458 or 2SC1740S
Q46 2SC2458 or 2SC1740S
Q43
Q44
PROTECTOR
FU1 15A
FU2 3A
FU3 4A
(ORANGE) BACK UP
(YELLOW) ILLUMI
(RED) ACC
(BLACK) GND
14.4v
D32 : CXA2183

SWITCHES

SW1: LOW BOOST SWITCH .... ON-OFF

SW2: LPF SWITCH .... ON-OFF

SW3: MODE SELECT SWITCH 1ch-2ch

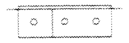
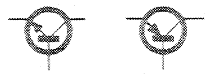
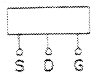
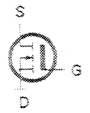
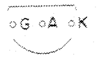
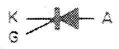
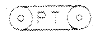
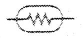
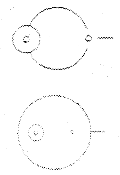
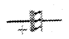
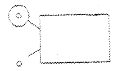
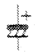
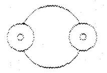
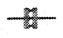
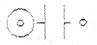
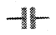
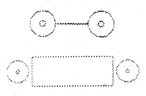
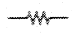
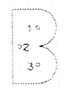
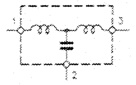
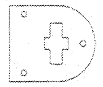
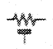
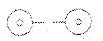
SW4: LOAD IMPEDANCE SWITCH 2Ω-4Ω

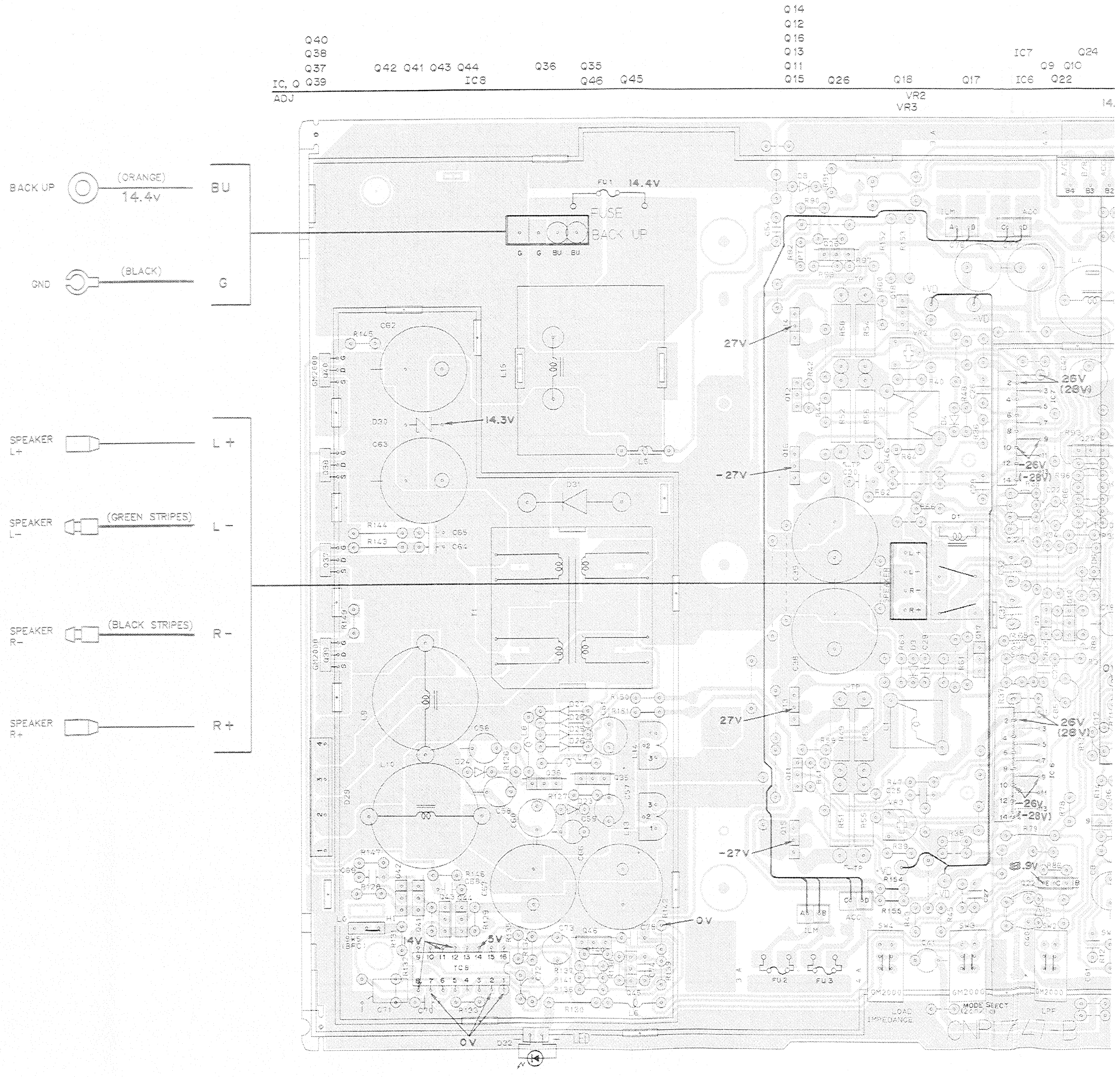
SW5: BFC SWITCH .... LOW-HIGH

The underlined indicates the switch position.

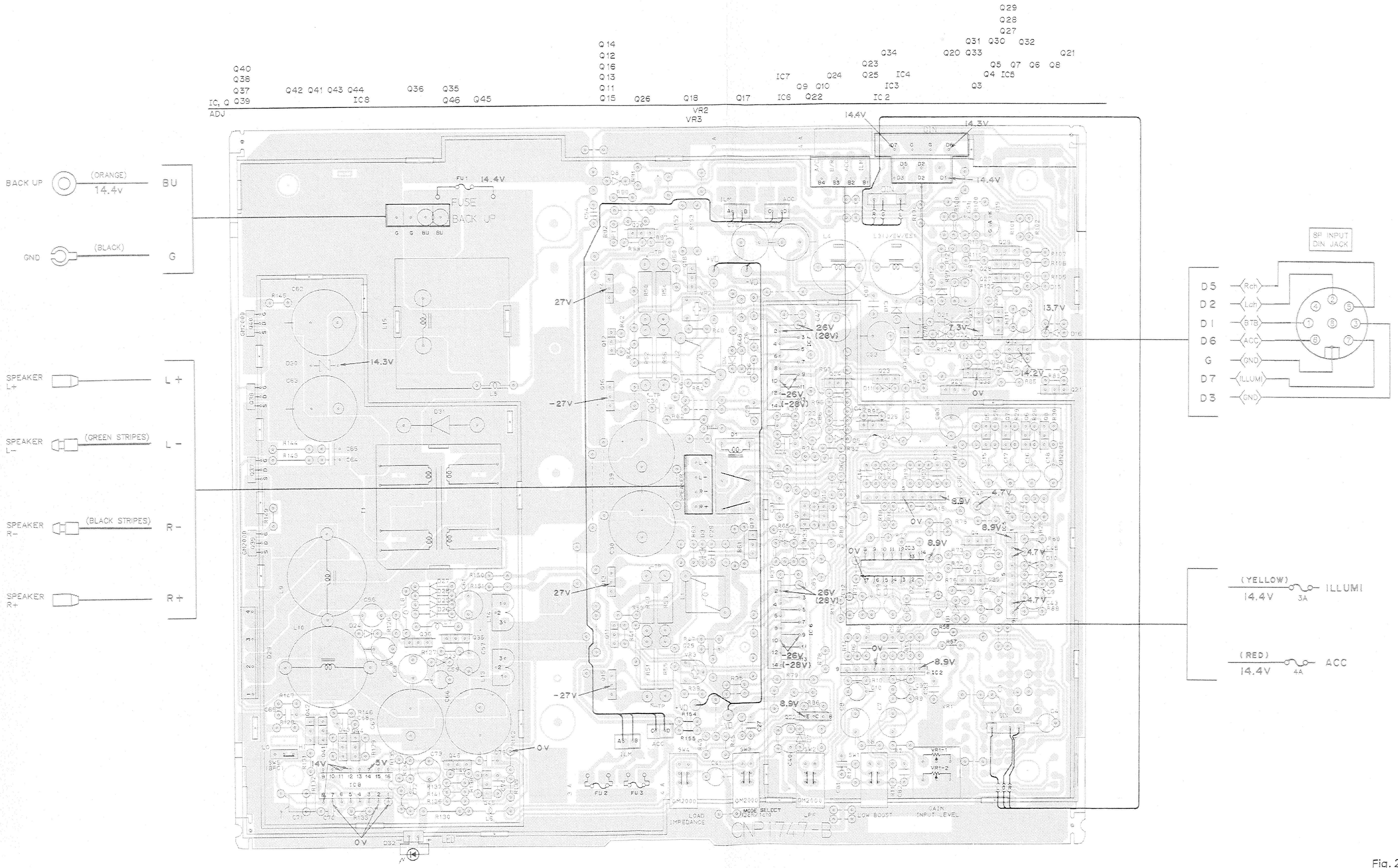
Fig. 21

9. CONNECTION DIAGRAM (GM-2000/EW)

Pattern symbol	Schematic symbol	Representation	Remarks
		Transistor	Transistor E comes in square ⊡ , then to left C and B follow unless otherwise indicated.
		FET	
		Thyristor	
		Posistor	
		Electrolytic capacitor (polarized)	In case of polarized electrolytic capacitor, terminal marked ⓒ indicates +.
		Electrolytic capacitor (polarized)	
	 (BP)	Electrolytic capacitor (nonpolarized)	
		Capacitor	
		Resistor	
		Filter	
		Semi-fixed resistor	
		Jumper	


Q40
Q38
Q37
IC, Q Q39
ADJ
Q42 Q41 Q43 Q44
IC8
Q36
Q35
Q46
Q45
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
VR2
VR3
Q17
IC7
Q9 Q10
IC6 Q22
Q24
BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
FU1 14.4V
FUSE
BACK UP
SPEAKER L+
L+
SPEAKER L−
(GREEN STRIPES)
L−
SPEAKER R−
(BLACK STRIPES)
R−
SPEAKER R+
R+
14.3V
27V
−27V
26V (28V)
−26V (−28V)
0V
14V
5V
8.9V
LED
GM2000
LOAD IMPEDANCE
MODE SELECT
LPF
CNP747-B

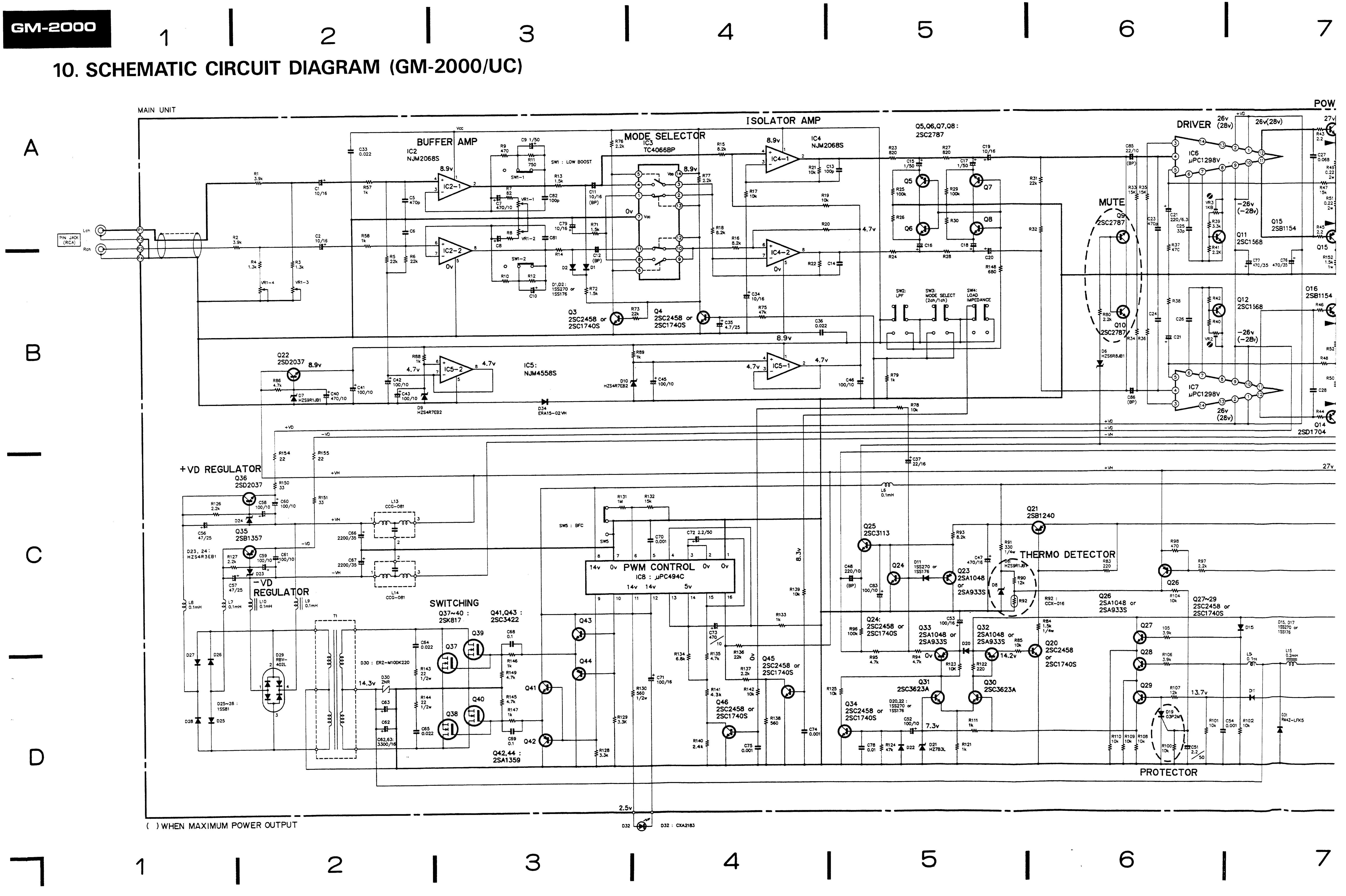
( ) WHEN MAXIMUM POWER OUTPUT

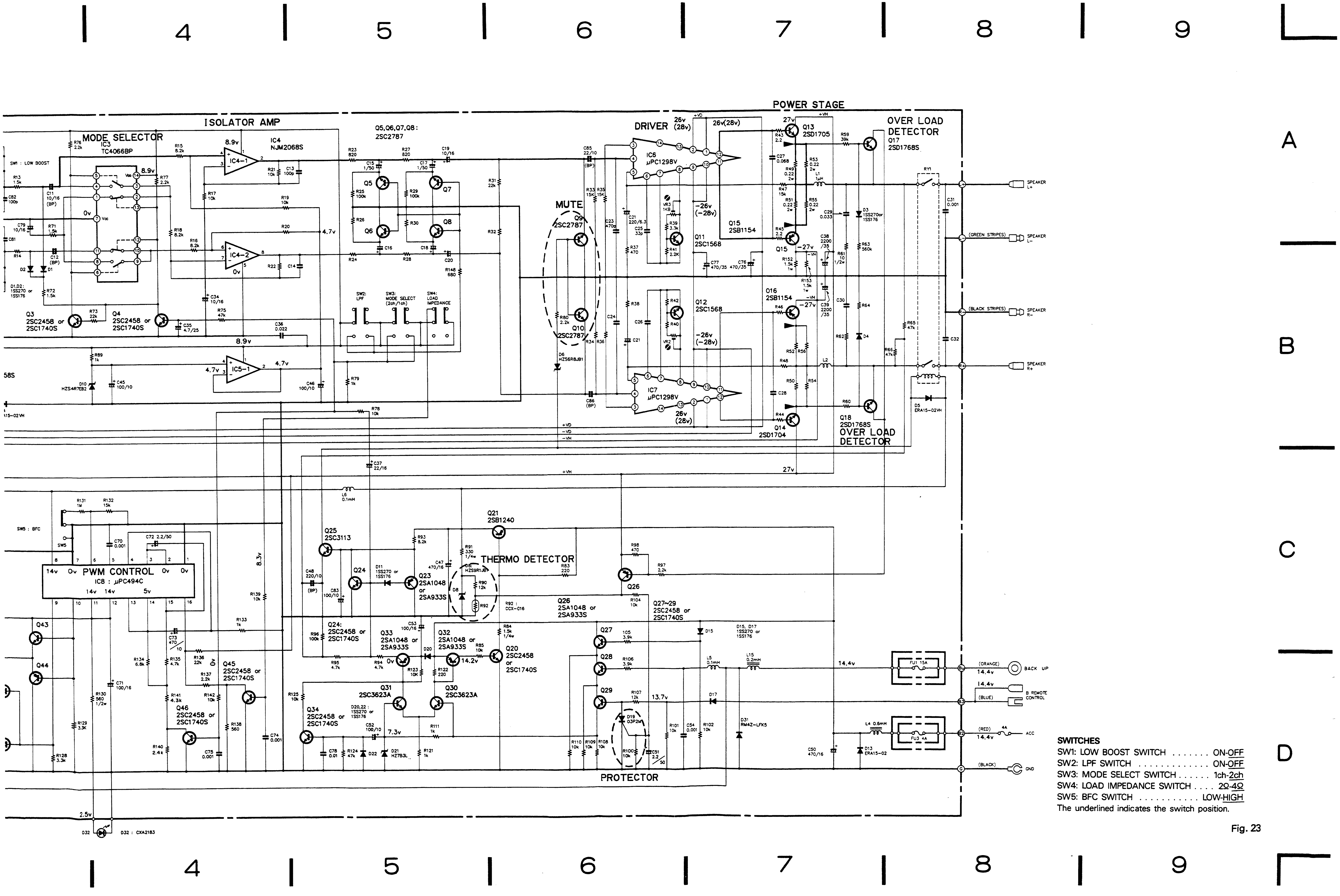

A
B
C
D
Q29
Q28
Q27
Q31 Q30 Q32
Q20 Q33
Q21
Q34
Q23
Q25
IC4
Q5 Q7 Q6 Q8
Q4 IC5
Q3
IC3
IC2
Q24
IC7
Q9 Q10
IC6 Q22
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
VR2
VR3
Q17
Q40
Q38
Q37
Q39
IC, Q
ADJ
Q42 Q41 Q43 Q44
IC8
Q36
Q35
Q46 Q45
BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
SPEAKER L+
L+
SPEAKER L−
(GREEN STRIPES)
L−
SPEAKER R−
(BLACK STRIPES)
R−
SPEAKER R+
R+
FU1
14.4V
FUSE
BACK UP
G G BU BU
14.3V
27V
−27V
27V
−27V
26V
(28V)
−26V
(−28V)
26V
(28V)
−26V
(−28V)
14.4V
14.3V
14.4V
13.7V
7.3V
14.2V
0V
8.9V
4.7V
8.9V
0V
8.9V
0V
4.7V
4.7V
0V
8.9V
8.9V
0V
14V
5V
0V
D32
LED
ILM
ACC
SW4
SW3
SW2
SW1
FU2
FU3
VR1−1
VR1−2
GM2000
LOAD IMPEDANCE
MODE SELECT
LPF
LOW BOOST
GAIN INPUT LEVEL
CNP1747-B
BP INPUT DIN JACK
D5 (Rch)
D2 (Lch)
D1 (BTB)
D6 (ACC)
G (GND)
D7 (ILLUMI)
D3 (GND)
(YELLOW)
14.4V
3A
ILLUMI
(RED)
14.4V
4A
ACC

( ) WHEN MAXIMUM POWER OUTPUT

Fig. 22

10. SCHEMATIC CIRCUIT DIAGRAM (GM-2000/UC)


1
2
3
4
5
6
7
A
B
C
D
MAIN UNIT
PIN JACK (RCA)
Lch
Rch
BUFFER AMP
IC2 NJM2068S
MODE SELECTOR
IC3 TC4066BP
ISOLATOR AMP
IC4 NJM2068S
IC5: NJM4558S
Q5,Q6,Q7,Q8 : 2SC2787
SW1 : LOW BOOST
SW2: LPF
SW3: MODE SELECT (2ch/1ch)
SW4: LOAD IMPEDANCE
DRIVER
IC6 μPC1298V
IC7 μPC1298V
MUTE
Q9 2SC2787
Q10 2SC2787
Q11 2SC1568
Q12 2SC1568
Q15 2SB1154
Q16 2SB1154
Q14 2SD1704
POW
Q3 2SC2458 or 2SC1740S
Q4 2SC2458 or 2SC1740S
Q22 2SD2037
+VD REGULATOR
Q36 2SD2037
Q35 2SB1357
-VD REGULATOR
L13 CCG-081
L14 CCG-081
SW5 : BFC
PWM CONTROL
IC8 : μPC494C
SWITCHING
Q37~40 : 2SK817
Q41,Q43 : 2SC3422
Q42,44 : 2SA1359
D29 RBV-402L
D30 : ERZ-M100K220
D25~28 : 1SS81
T1
THERMO DETECTOR
Q21 2SB1240
Q25 2SC3113
Q23 2SA1048 or 2SA933S
Q24: 2SC2458 or 2SC1740S
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
Q30 2SC3623A
Q31 2SC3623A
Q32 2SA1048 or 2SA933S
Q33 2SA1048 or 2SA933S
Q34 2SC2458 or 2SC1740S
Q20 2SC2458 or 2SC1740S
Q45 2SC2458 or 2SC1740S
Q46 2SC2458 or 2SC1740S
R92 : CCX-016
PROTECTOR
D32 : CXA2183
( ) WHEN MAXIMUM POWER OUTPUT



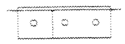
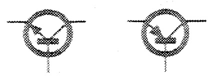
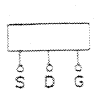
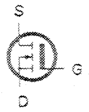
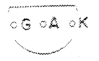
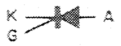
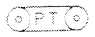
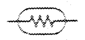
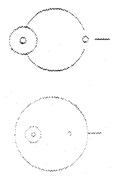
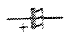
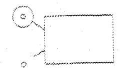
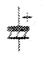
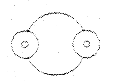
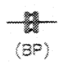
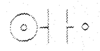
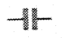
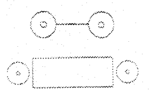
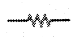
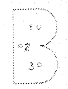
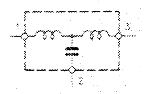
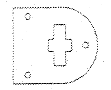
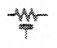
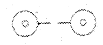
4
5
6
7
8
9
A
B
C
D
ISOLATOR AMP
MODE SELECTOR
IC3 TC4066BP
IC4 NJM2068S
IC4-1
IC4-2
IC5-1
8.9v
4.7v
Q5,Q6,Q7,Q8 : 2SC2787
SW1 : LOW BOOST
SW2: LPF
SW3: MODE SELECT (2ch/1ch)
SW4: LOAD IMPEDANCE
Q3 2SC2458 or 2SC1740S
Q4 2SC2458 or 2SC1740S
D10 HZS4R7EB2
MUTE
Q9 2SC2787
Q10 2SC2787
D6 HZS6R8JB1
DRIVER
IC6 µPC1298V
IC7 µPC1298V
26v (28v)
-26v (-28v)
POWER STAGE
Q11 2SC1568
Q12 2SC1568
Q13 2SD1705
Q14 2SD1704
Q15 2SB1154
Q16 2SB1154
OVER LOAD DETECTOR
Q17 2SD1768S
Q18 2SD1768S
RY1
D5 ERA15-02VH
SPEAKER L+
SPEAKER L-
SPEAKER R-
SPEAKER R+
(GREEN STRIPES)
(BLACK STRIPES)
27v
+VH
+VD
-VD
-VH
SW5 : BFC
PWM CONTROL
IC8 : µPC494C
14v
0v
5v
Q43
Q44
Q45 2SC2458 or 2SC1740S
Q46 2SC2458 or 2SC1740S
D32 : CXA2183
2.5v
8.3v
Q25 2SC3113
Q24: 2SC2458 or 2SC1740S
Q23 2SA1048 or 2SA933S
Q21 2SB1240
THERMO DETECTOR
D8: HZS9R1JB1
R92 : CCX-016
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
Q33 2SA1048 or 2SA933S
Q32 2SA1048 or 2SA933S
Q20 2SC2458 or 2SC1740S
Q31 2SC3623A
Q30 2SC3623A
Q34 2SC2458 or 2SC1740S
D21 HZ7B3L
D20,22 : 1SS270 or 1SS176
14.2v
7.3v
13.7v
D15, D17 1SS270 or 1SS176
D19 03P2M
D31 RM4Z-LFK5
D13 ERA15-02
L5 0.1mH
L15 0.2mH
L4 0.6mH
FU1 15A
FU3 4A
14.4v
(ORANGE)
BACK UP
(BLUE)
B REMOTE CONTROL
(RED)
ACC
(BLACK)
GND
PROTECTOR

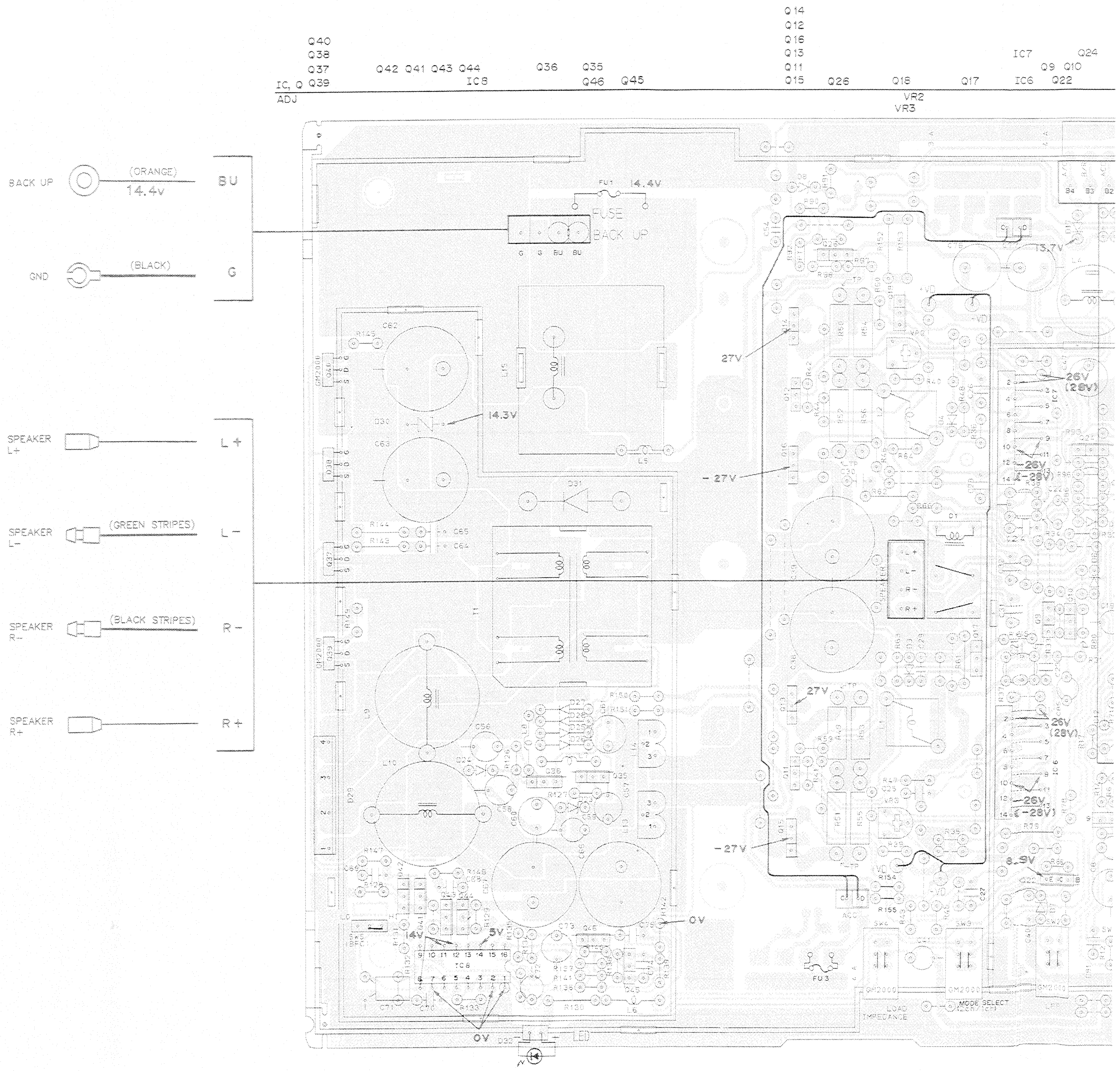
SWITCHES

SW1: LOW BOOST SWITCH .... ON-OFF
SW2: LPF SWITCH .... ON-OFF
SW3: MODE SELECT SWITCH 1ch-2ch
SW4: LOAD IMPEDANCE SWITCH 2Ω-4Ω
SW5: BFC SWITCH .... LOW-HIGH
The underlined indicates the switch position.

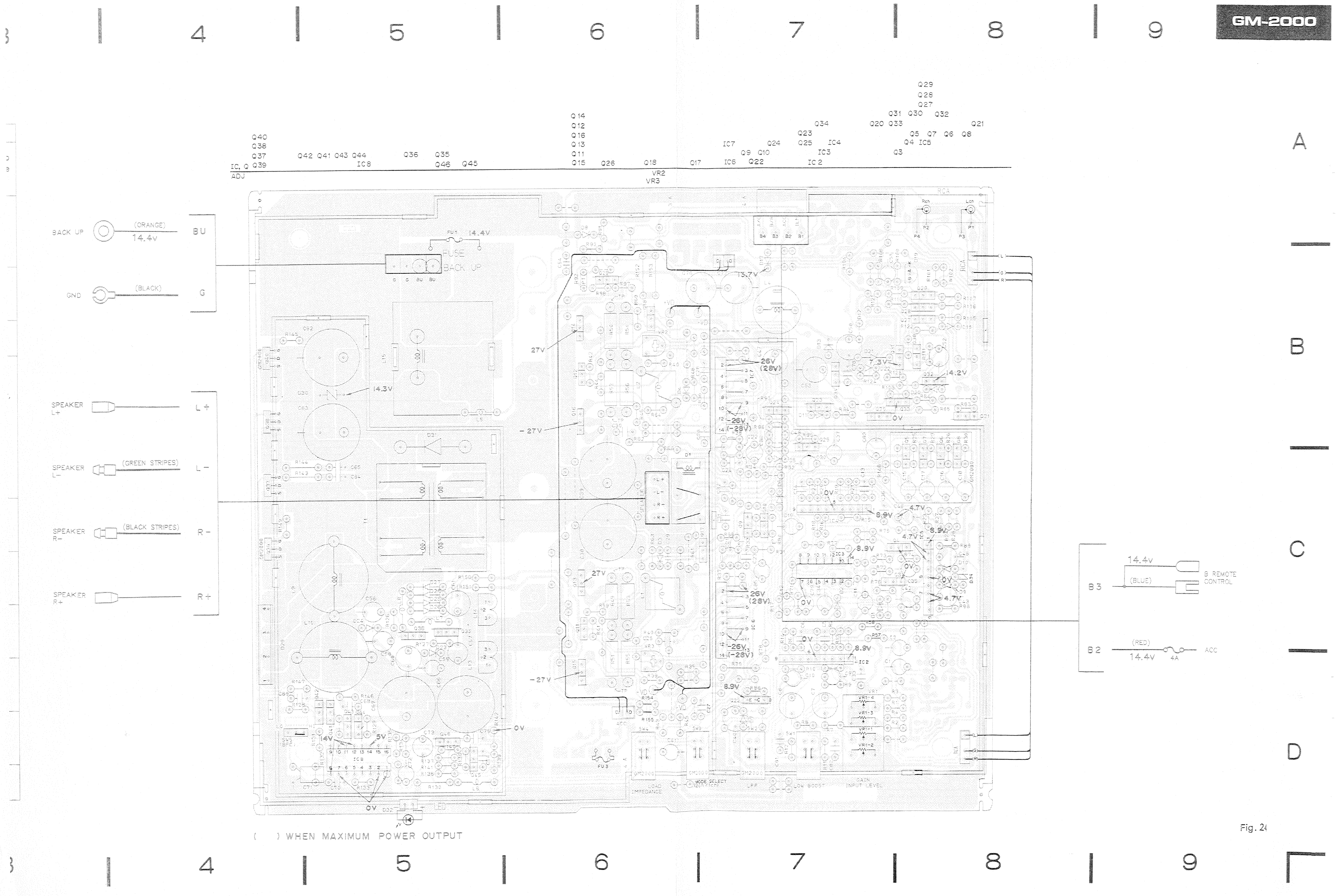
Fig. 23

11. CONNECTION DIAGRAM (GM-2000/UC)

Pattern symbol	Schematic symbol	Representation	Remarks
		Transistor	Transistor E comes in square ⊡, then to left C and B follow unless otherwise indicated.
		FET	
		Thyristor	
		Posistor	
		Electrolytic capacitor (polarized)	In case of polarized electrolytic capacitor, terminal marked ◎ indicates +.
		Electrolytic capacitor (polarized)	
		Electrolytic capacitor (nonpolarized)	
		Capacitor	
		Resistor	
		Filter	
		Semi-fixed resistor	
		Jumper	


BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
SPEAKER L+
L+
SPEAKER L−
(GREEN STRIPES)
L−
SPEAKER R−
(BLACK STRIPES)
R−
SPEAKER R+
R+
IC, Q ADJ
Q40
Q38
Q37
Q39
Q42 Q41 Q43 Q44
IC8
Q36
Q35
Q46
Q45
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
VR2
VR3
Q17
IC7
IC6
Q24
Q9 Q10
Q22
FU1 14.4V
FUSE
BACK UP
13.7V
14.3V
27V
−27V
27V
−27V
26V
(28V)
26V
(−28V)
26V
(28V)
26V
(−28V)
6.9V
14V
5V
0V
0V
IC6
FU3
LED
LOAD IMPEDANCE
MODE SELECT

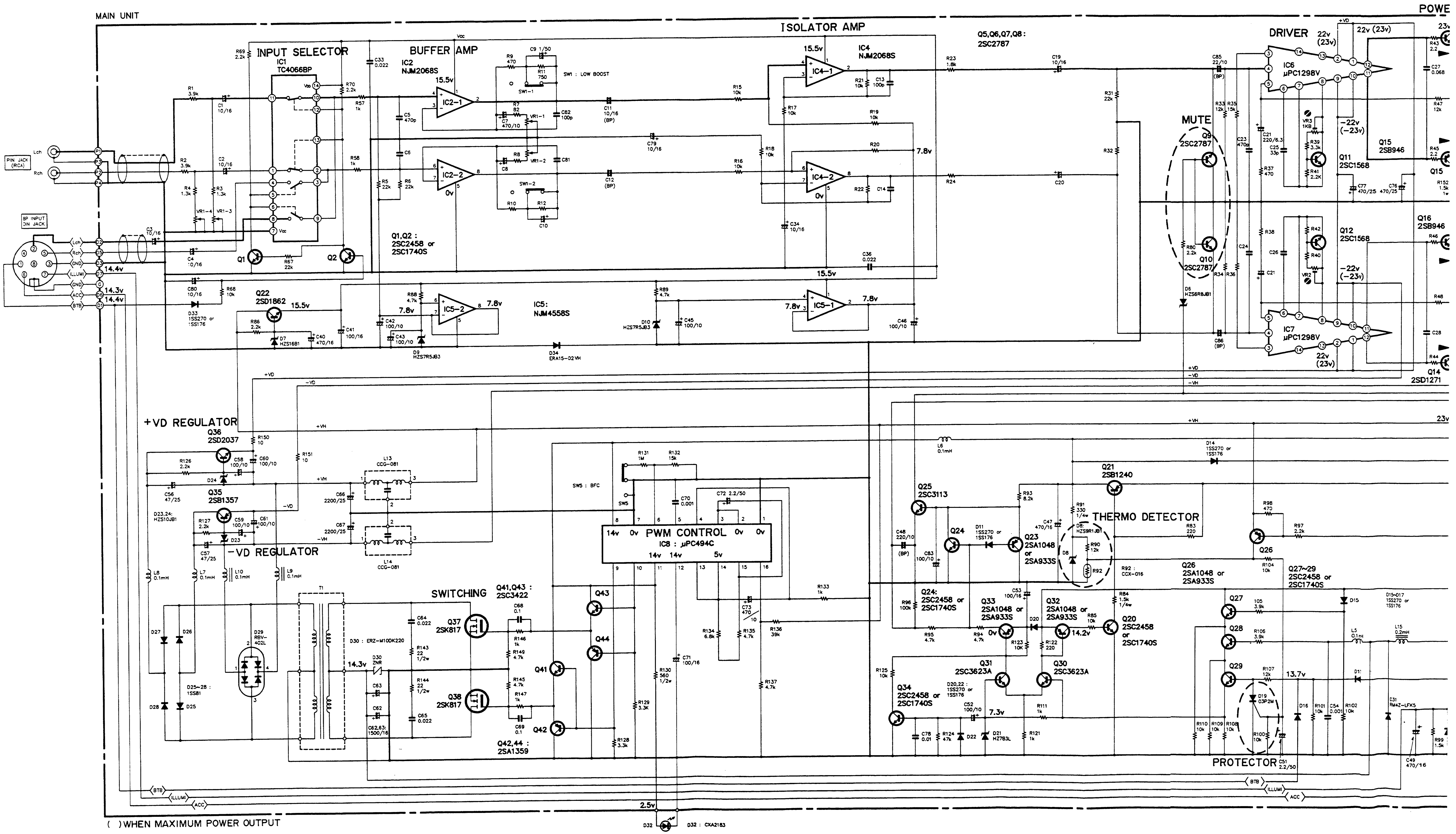
( ) WHEN MAXIMUM POWER OUTPUT


3
4
5
6
7
8
9
A
B
C
D
IC, Q
ADJ
Q40
Q38
Q37
Q39
Q42 Q41 Q43 Q44
IC8
Q36
Q35
Q46
Q45
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
VR2
VR3
Q17
IC7
IC6
Q9 Q10
Q22
Q24
Q23
Q25
Q34
IC4
IC3
IC2
Q29
Q28
Q27
Q31 Q30 Q32
Q20 Q33
Q21
Q5 Q7 Q6 Q8
Q4 IC5
Q3
BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
FU1
14.4V
FUSE
BACK UP
SPEAKER L+
L+
SPEAKER L−
(GREEN STRIPES)
L−
SPEAKER R−
(BLACK STRIPES)
R−
SPEAKER R+
R+
14.3V
27V
−27V
27V
−27V
13.7V
26V
(28V)
−26V
(−28V)
26V
(28V)
−26V
(−28V)
7.3V
14.2V
0V
8.9V
4.7V
8.9V
4.7V
8.9V
0V
0V
4.7V
0V
0V
8.9V
8.9V
14V
5V
0V
0V
SPEAKER
L+
L−
R−
R+
RCA
Rch
Lch
P1 P2 P3 P4
B4 B3 B2 B1
L
G
R
IC8
D32
LED
FU3
ACC
SW4
SW3
SW2
SW1
LOAD IMPEDANCE
MODE SELECT
LPF
LOW BOOST
GAIN INPUT LEVEL
VR1-4
VR1-3
VR1-1
VR1-2
GM2000
B3
14.4V
(BLUE)
B REMOTE CONTROL
B2
(RED)
14.4V
4A
ACC

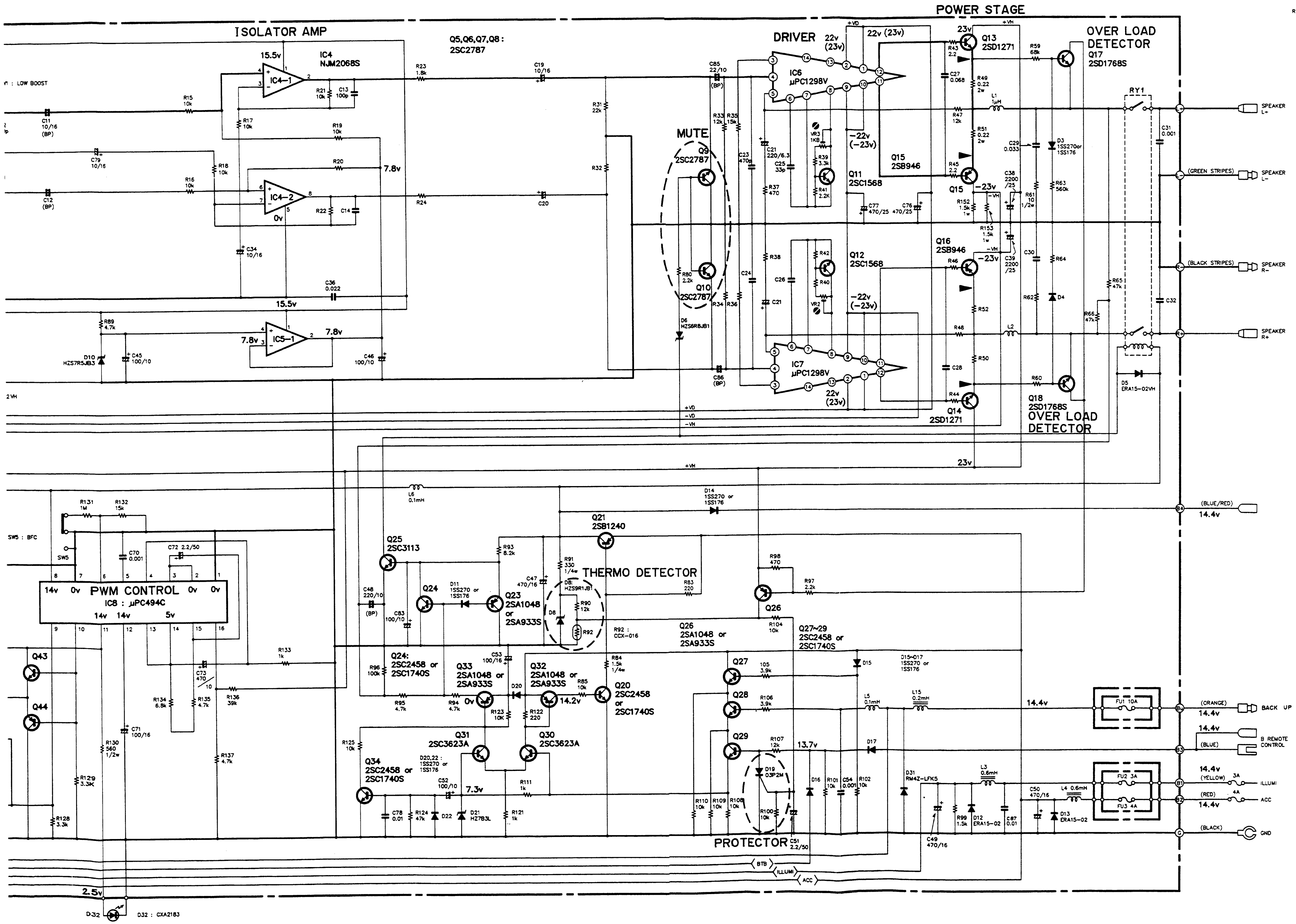
( ) WHEN MAXIMUM POWER OUTPUT

Fig. 2

12. SCHEMATIC CIRCUIT DIAGRAM (GM-1000/ES)


MAIN UNIT
INPUT SELECTOR
IC1 TC4066BP
BUFFER AMP
IC2 NJM2068S
ISOLATOR AMP
IC4 NJM2068S
Q5,Q6,Q7,Q8 : 2SC2787
DRIVER
IC6 µPC1298V
IC7 µPC1298V
MUTE
Q9 2SC2787
Q10 2SC2787
PIN JACK (RCA)
BP INPUT DIN JACK
Lch
Rch
SW1 : LOW BOOST
Q1,Q2 : 2SC2458 or 2SC1740S
Q22 2SD1862
IC5: NJM4558S
+VD REGULATOR
Q36 2SD2037
Q35 2SB1357
-VD REGULATOR
D23,24: HZS10JB1
L13 CCG-081
L14 CCG-081
SW5 : BFC
PWM CONTROL
IC8 : µPC494C
SWITCHING
Q41,Q43 : 2SC3422
Q42,44 : 2SA1359
Q37 2SK817
Q38 2SK817
D30 : ERZ-M10DK220
D29 RBV-402L
D25~28 : 1SS81
T1
Q21 2SB1240
Q25 2SC3113
THERMO DETECTOR
R92 : CCX-016
Q23 2SA1048 or 2SA933S
Q24: 2SC2458 or 2SC1740S
Q33 2SA1048 or 2SA933S
Q32 2SA1048 or 2SA933S
Q20 2SC2458 or 2SC1740S
Q31 2SC3623A
Q30 2SC3623A
Q34 2SC2458 or 2SC1740S
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
PROTECTOR
Q11 2SC1568
Q12 2SC1568
Q15 2SB946
Q16 2SB946
Q14 2SD1271
D32 : CXA2183
POWE

( ) WHEN MAXIMUM POWER OUTPUT


4
5
6
7
8
9
A
B
C
D
ISOLATOR AMP
IC4 NJM2068S
IC4-1
IC4-2
IC5-1
15.5v
7.8v
Q5,Q6,Q7,Q8 : 2SC2787
MUTE
Q9 2SC2787
Q10 2SC2787
POWER STAGE
DRIVER
IC6 µPC1298V
IC7 µPC1298V
22v (23v)
-22v (-23v)
Q11 2SC1568
Q12 2SC1568
Q13 2SD1271
Q14 2SD1271
Q15 2SB946
Q16 2SB946
OVER LOAD DETECTOR
Q17 2SD1768S
Q18 2SD1768S
RY1
SPEAKER L+
SPEAKER L-
SPEAKER R-
SPEAKER R+
(GREEN STRIPES)
(BLACK STRIPES)
(BLUE/RED)
14.4v
THERMO DETECTOR
Q21 2SB1240
Q25 2SC3113
Q23 2SA1048 or 2SA933S
Q24: 2SC2458 or 2SC1740S
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
Q33 2SA1048 or 2SA933S
Q32 2SA1048 or 2SA933S
Q20 2SC2458 or 2SC1740S
Q31 2SC3623A
Q30 2SC3623A
Q34 2SC2458 or 2SC1740S
PWM CONTROL
IC8 : µPC494C
SW5 : BFC
Q43
Q44
PROTECTOR
(ORANGE) BACK UP
FU1 10A
B REMOTE CONTROL
(BLUE)
(YELLOW) ILLUMI
(RED) ACC
FU2 3A
FU3 4A
(BLACK) GND
D32 : CXA2183
2.5v

SWITCHES

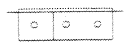
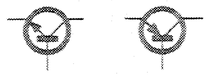
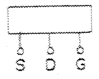
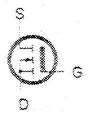
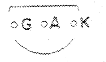
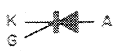
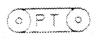
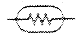
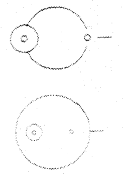
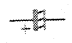
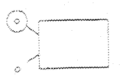
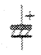
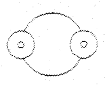
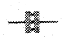
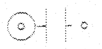
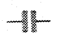
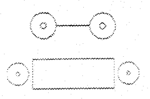
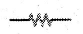
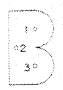
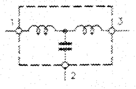
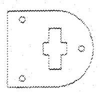
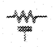
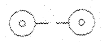
SW1: LOW BOOST SWITCH .... ON-OFF

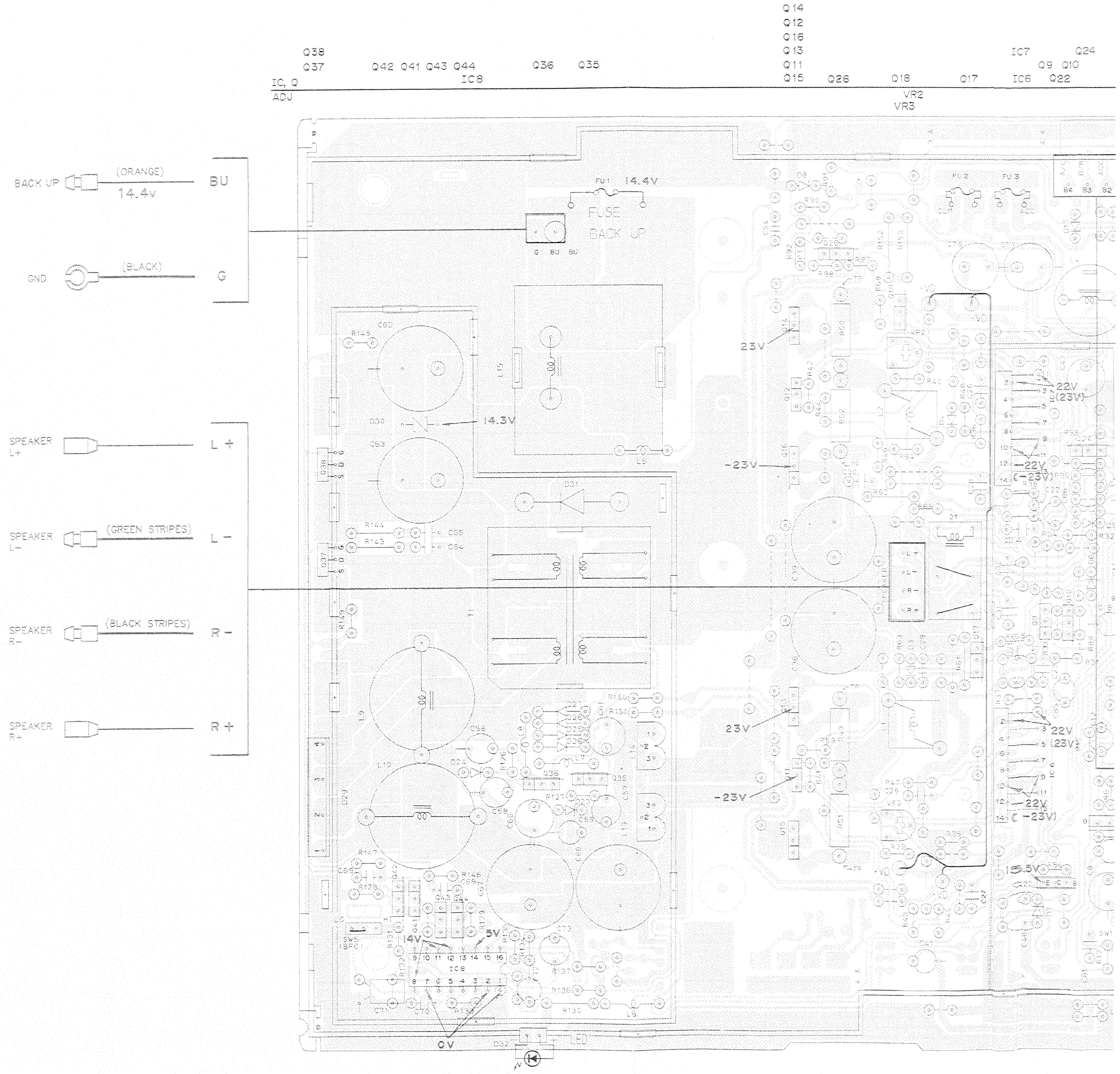
SW5: BFC SWITCH .... LOW-HIGH

The underlined indicates the switch positon.

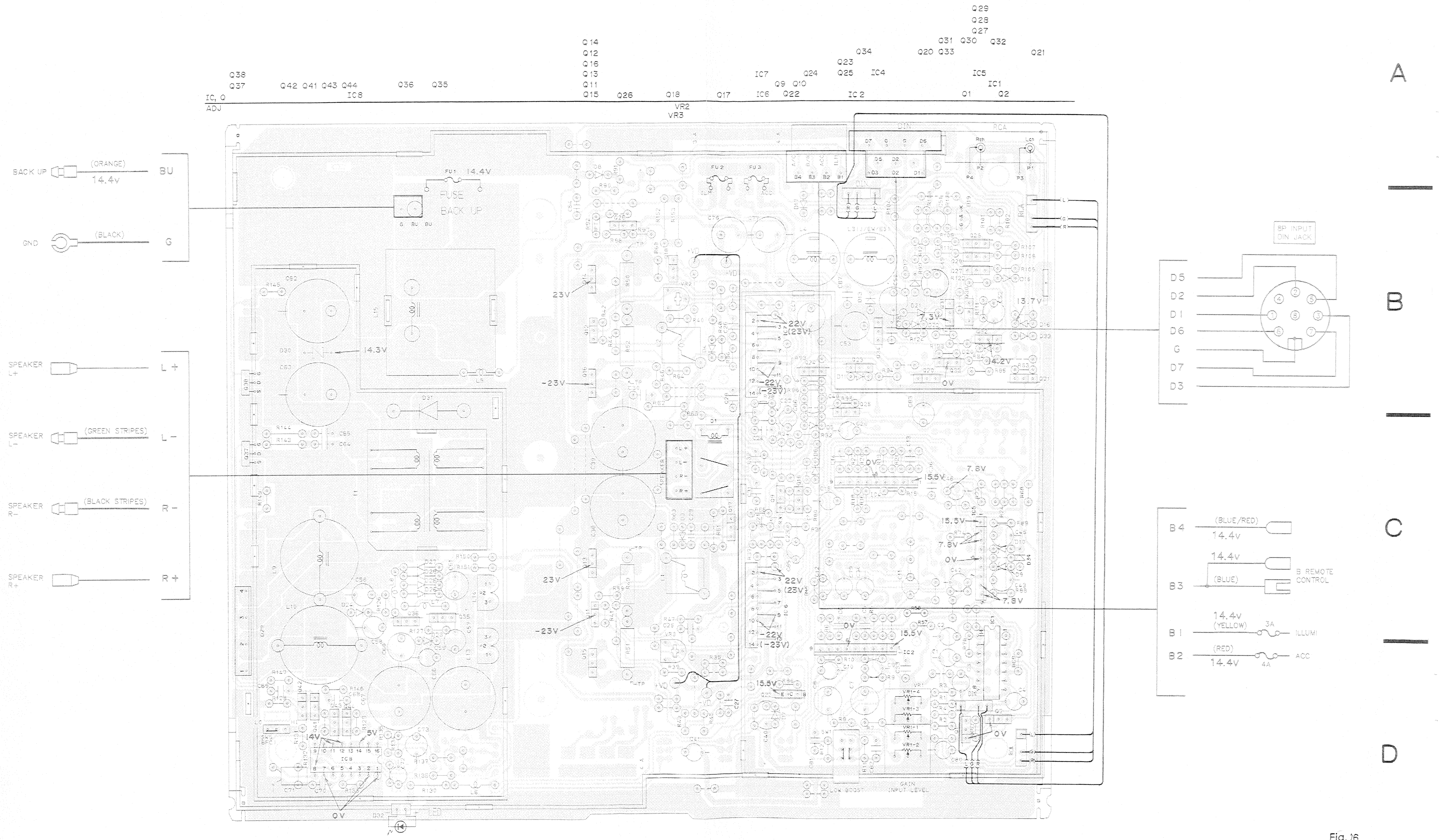
Fig. 25

13. CONNECTION DIAGRAM (GM-1000/ES)

Pattern symbol	Schematic symbol	Representation	Remarks
		Transistor	Transistor E comes in square ▢, then to left C and B follow unless otherwise indicated.
		FET	
		Thyristor	
		Posistor	
		Electrolytic capacitor (polarized)	In case of polarized electrolytic capacitor, terminal marked ⓒ indicates +.
		Electrolytic capacitor (polarized)	
	 (BP)	Electrolytic capacitor (nonpolarized)	
		Capacitor	
		Resistor	
		Filter	
		Semi-fixed resistor	
		Jumper	


Q38
Q37
Q42 Q41 Q43 Q44
IC8
Q36 Q35
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
Q17
IC7
Q24
Q9 Q10
IC6 Q22
IC, Q
ADJ
VR2
VR3
BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
FU1 14.4V
FUSE
BACK UP
FU2
FU3
SPEAKER L+
L+
SPEAKER L−
(GREEN STRIPES)
L−
SPEAKER R−
(BLACK STRIPES)
R−
SPEAKER R+
R+
14.3V
23V
−23V
22V
(23V)
22V
(−23V)
23V
−23V
22V
(23V)
22V
(−23V)
15.5V
14V
5V
0V

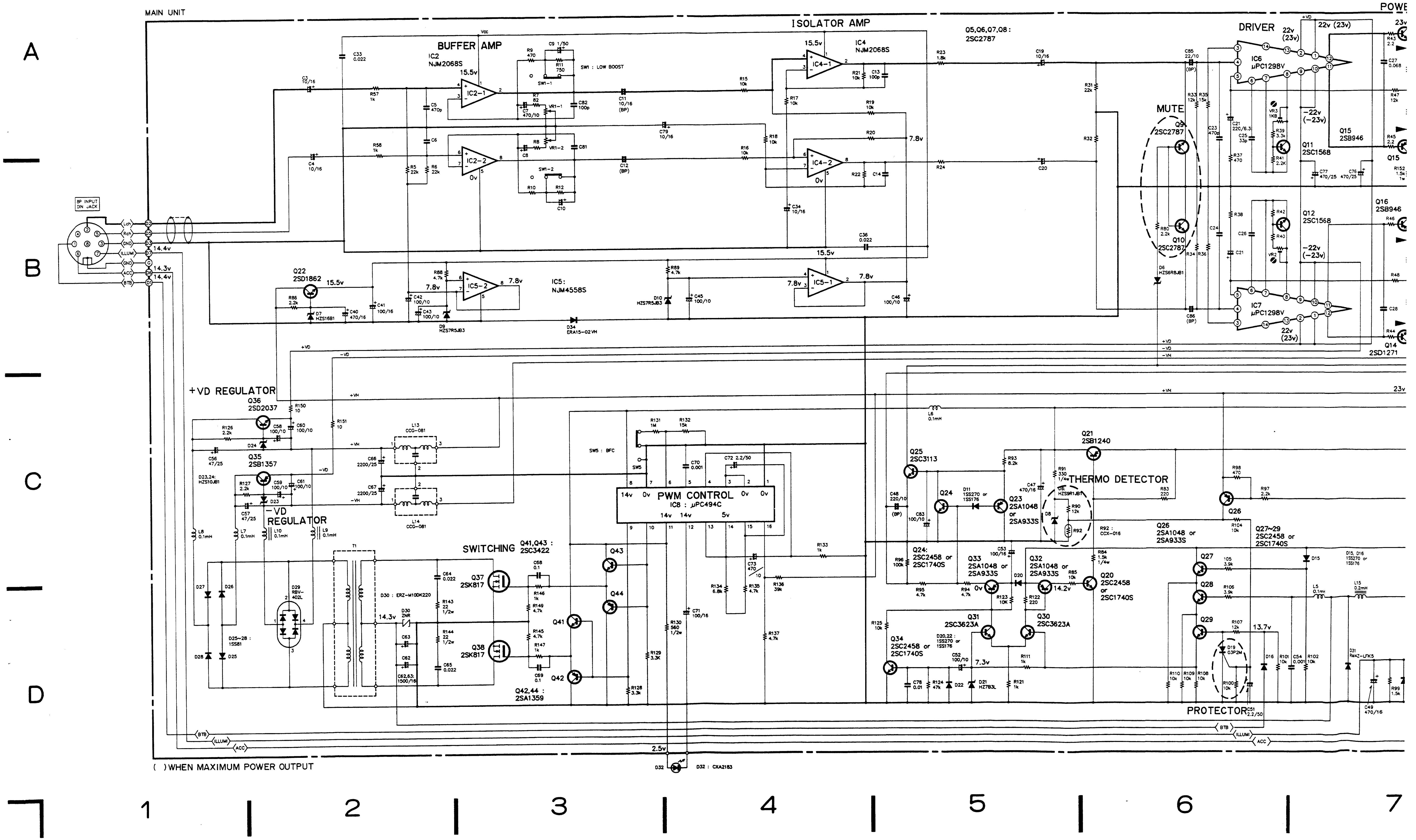
( ) WHEN MAXIMUM POWER OUTPUT


Q29
Q28
Q27
Q31 Q30 Q32
Q20 Q33
Q21
Q34
Q23
Q25
IC4
IC5
IC1
Q1 Q2
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
VR2
VR3
Q17
IC6
IC7
Q9 Q10
Q22
Q24
IC2
Q38
Q37
Q42 Q41 Q43 Q44
IC8
Q36 Q35
IC, Q
ADJ
A
B
C
D
BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
SPEAKER L+
L+
SPEAKER L−
(GREEN STRIPES)
L−
SPEAKER R−
(BLACK STRIPES)
R−
SPEAKER R+
R+
FU1 14.4V
FUSE
BACK UP
FU2
FU3
14.3V
23V
−23V
23V
−23V
22V
(23V)
−22V
(−23V)
22V
(23V)
−22V
(−23V)
7.3V
13.7V
14.2V
0V
7.8V
15.5V
15.5V
7.8V
0V
7.8V
0V
15.5V
15.5V
0V
14V
5V
0V
DIN
RCA
Rch
Lch
LOW BOOST
GAIN
INPUT LEVEL
8P INPUT
DIN JACK
D5
D2
D1
D6
G
D7
D3
B4
(BLUE/RED)
14.4V
14.4V
B REMOTE
CONTROL
B3
(BLUE)
B1
14.4V
(YELLOW)
3A
ILLUMI
B2
(RED)
14.4V
4A
ACC

( ) WHEN MAXIMUM POWER OUTPUT

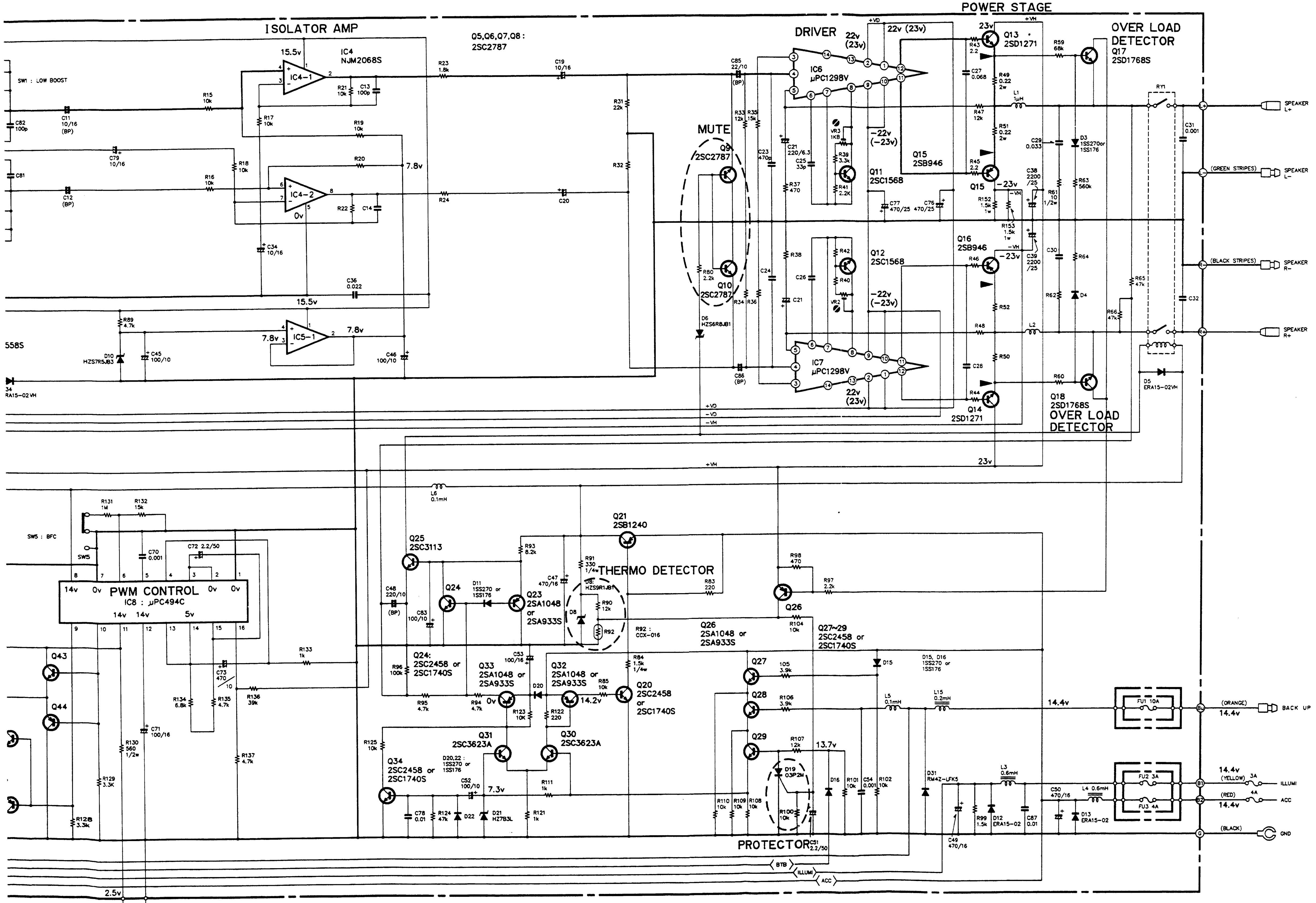
Fig. 16

14. SCHEMATIC CIRCUIT DIAGRAM (GM-1000/EW)


A
B
C
D
MAIN UNIT
BP INPUT DIN JACK
Lch
Rch
GND
ILLUMI
GND
ACC
BTB
14.4v
14.3v
14.4v
BUFFER AMP
IC2 NJM2068S
15.5v
IC2-1
IC2-2
0v
C33 0.022
C3 10/16
C4 10/16
R57 1k
R58 1k
C5 470p
C6
R5 22k
R6 22k
R9 470
C9 1/50
R11 750
SW1 : LOW BOOST
SW1-1
SW1-2
R7 82
C7 470/10
VR1-1
VR1-2
R8
C8
C82 100p
C81
R10
R12
C10
C11 10/16 (BP)
C12 (BP)
C79 10/16
ISOLATOR AMP
IC4 NJM2068S
15.5v
IC4-1
IC4-2
R15 10k
R16 10k
R17 10k
R18 10k
R19 10k
R20
R21 10k
C13 100p
R22
C14
C34 10/16
C36 0.022
7.8v
0v
15.5v
Q5,Q6,Q7,Q8 : 2SC2787
R23 1.8k
R24
C19 10/16
C20
R31 22k
R32
Q22 2SD1862
15.5v
R86 2.2k
D7 HZS16B1
C40 470/16
C41 100/16
R88 4.7k
C42 100/10
C43 100/10
D9 HZS7R5JB3
IC5-2
IC5: NJM4558S
7.8v
R89 4.7k
D10 HZS7R5JB3
C45 100/10
IC5-1
C46 100/10
D34 ERA15-02VH
+VD
-VD
+VH
-VH
+VD REGULATOR
Q36 2SD2037
R150 10
R126 2.2k
C58 100/10
C60 100/10
D24
C56 47/25
Q35 2SB1357
R151 10
D23,24: HZS10JB1
R127 2.2k
C59 100/10
C61 100/10
D23
C57 47/25
-VD REGULATOR
L6 0.1mH
L7 0.1mH
L10 0.1mH
L9 0.1mH
L13 CCG-081
L14 CCG-081
C66 2200/25
C67 2200/25
T1
D27
D26
D28
D25
D25~28 : 1SS81
D29 RBV-402L
D30 : ERZ-M10DK220
D30 ZNR
14.3v
C63
C62
C62,63: 1500/16
C64 0.022
C65 0.022
R143 22 1/2w
R144 22 1/2w
SWITCHING
Q41,Q43 : 2SC3422
Q37 2SK817
Q38 2SK817
C68 0.1
C69 0.1
R146 1k
R149 4.7k
R145 4.7k
R147 1k
Q41
Q42
Q43
Q44
Q42,44 : 2SA1359
SW5 : BFC
SW5
R131 1M
R132 15k
C70 0.001
C72 2.2/50
PWM CONTROL
IC8 : µPC494C
14v
0v
5v
C71 100/16
R130 560 1/2w
R129 3.3K
R128 3.3K
C73 470
R133 1k
R134 6.8k
R135 4.7k
R136 39k
R137 4.7k
2.5v
D32
D32 : CXA2183
MUTE
Q9 2SC2787
Q10 2SC2787
R80 2.2k
D6 HZS6R8JB1
R33 12k
R35 15k
R34
R36
C85 22/10 (BP)
C86 (BP)
C23 470p
C24
DRIVER
IC6 µPC1298V
IC7 µPC1298V
22v (23v)
-22v (-23v)
C21 220/6.3
C25 33p
VR3 1KB
VR2
R39 3.3k
R41 2.2K
R37 470
R38
C26
C21
R42
R40
Q11 2SC1568
Q12 2SC1568
Q15 2SB946
Q16 2SB946
Q14 2SD1271
C77 470/25
C76 470/25
R43 2.2
R45 2.2
R46
R47 12k
R48
R44
R152 1.5k 1w
C27 0.068
C28
POWE
23v
Q15
+VH
23v
L6 0.1mH
Q25 2SC3113
Q21 2SB1240
R93 8.2k
R91 330 1/4w
THERMO DETECTOR
C47 470/16
D8 HZS9R1JB1
R90 12k
R92
R92 : CCX-016
R83 220
C48 220/10 (BP)
C83 100/10
Q24
D11 1SS270 or 1SS176
Q23 2SA1048 or 2SA933S
Q24: 2SC2458 or 2SC1740S
R96 100k
R95 4.7k
Q33 2SA1048 or 2SA933S
C53 100/16
R94 4.7k
0v
D20
Q32 2SA1048 or 2SA933S
R85 10k
14.2v
R84 1.5k 1/4w
Q20 2SC2458 or 2SC1740S
R123 10K
R122 220
Q31 2SC3623A
Q30 2SC3623A
R125 10k
Q34 2SC2458 or 2SC1740S
D20,22 : 1SS270 or 1SS176
C52 100/10
7.3v
R111 1k
C78 0.01
R124 47k
D22
D21 HZ7B3L
R121 1k
R98 470
R97 2.2k
Q26
R104 10k
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
Q27
Q28
Q29
105 3.9k
R106 3.9k
R107 12k
13.7v
D15
D15, D16 1SS270 or 1SS176
L5 0.1mH
L15 0.2mH
D19 03P2M
R110 10k
R109 10k
R108 10k
R100 10k
D16
R101 10k
C54 0.001
R102 10k
D31 RM4Z-LFK5
R99 1.5k
C49 470/16
PROTECTOR
C51 2.2/50
BTB
ILLUMI
ACC
( ) WHEN MAXIMUM POWER OUTPUT
1 2 3 4 5 6 7

4 5 6 7 8 9

A


ISOLATOR AMP
IC4 NJM2068S
IC4-1
IC4-2
IC5-1
15.5v
7.8v
0v
SW1 : LOW BOOST
Q5,Q6,Q7,Q8 : 2SC2787
R23 1.8k
C19 10/16
R24
C20
R31 22k
R32
POWER STAGE
DRIVER
IC6 μPC1298V
IC7 μPC1298V
22v (23v)
-22v (-23v)
MUTE
Q9 2SC2787
Q10 2SC2787
D6 HZS6R8JB1
Q11 2SC1568
Q12 2SC1568
Q13 2SD1271
Q14 2SD1271
Q15 2SB946
Q16 2SB946
23v
-23v
OVER LOAD DETECTOR
Q17 2SD1768S
Q18 2SD1768S
D3 1SS270or 1SS176
D5 ERA15-02VH
RY1
SPEAKER L+
(GREEN STRIPES) SPEAKER L-
(BLACK STRIPES) SPEAKER R-
SPEAKER R+
+VD
-VD
-VH
+VH
L6 0.1mH
SW5 : BFC
SW5
PWM CONTROL
IC8 : μPC494C
14v 0v 0v 0v
14v 14v 5v
C72 2.2/50
C70 0.001
R131 1M
R132 15k
R133 1k
Q43
Q44
Q25 2SC3113
Q24
D11 1SS270 or 1SS176
Q23 2SA1048 or 2SA933S
Q21 2SB1240
THERMO DETECTOR
D8 HZS9R1JB1
R91 330 1/4w
R92 : CCX-016
Q26
Q26 2SA1048 or 2SA933S
Q24: 2SC2458 or 2SC1740S
Q33 2SA1048 or 2SA933S
Q32 2SA1048 or 2SA933S
Q20 2SC2458 or 2SC1740S
Q31 2SC3623A
Q30 2SC3623A
Q34 2SC2458 or 2SC1740S
D20,22 : 1SS270 or 1SS176
D21 HZ7B3L
14.2v
7.3v
Q27~29 2SC2458 or 2SC1740S
Q27
Q28
Q29
D15, D16 1SS270 or 1SS176
D19 03P2M
13.7v
PROTECTOR
D31 RM4Z-LFK5
L5 0.1mH
L15 0.2mH
L3 0.6mH
L4 0.6mH
D12 ERA15-02
D13 ERA15-02
14.4v
FU1 10A
FU2 3A
FU3 4A
(ORANGE) BACK UP
(YELLOW) 3A ILLUMI
(RED) 4A ACC
(BLACK) GND
BTB
ILLUMI
ACC
2.5v
D32 : CXA2183
558S
D10 HZS7R5JB3
34 ERA15-02VH

B

C

D

SWITCHES

SW1: LOW BOOST SWITCH .... ON-OFF

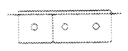
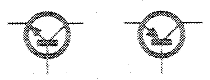
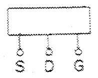
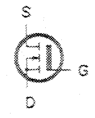
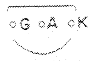
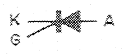
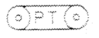
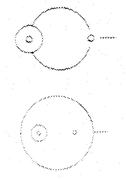
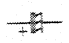
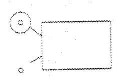
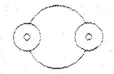
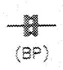
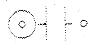
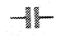
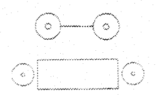
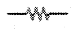
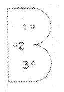
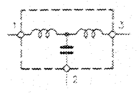
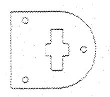
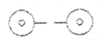
SW5: BFC SWITCH .... LOW-HIGH

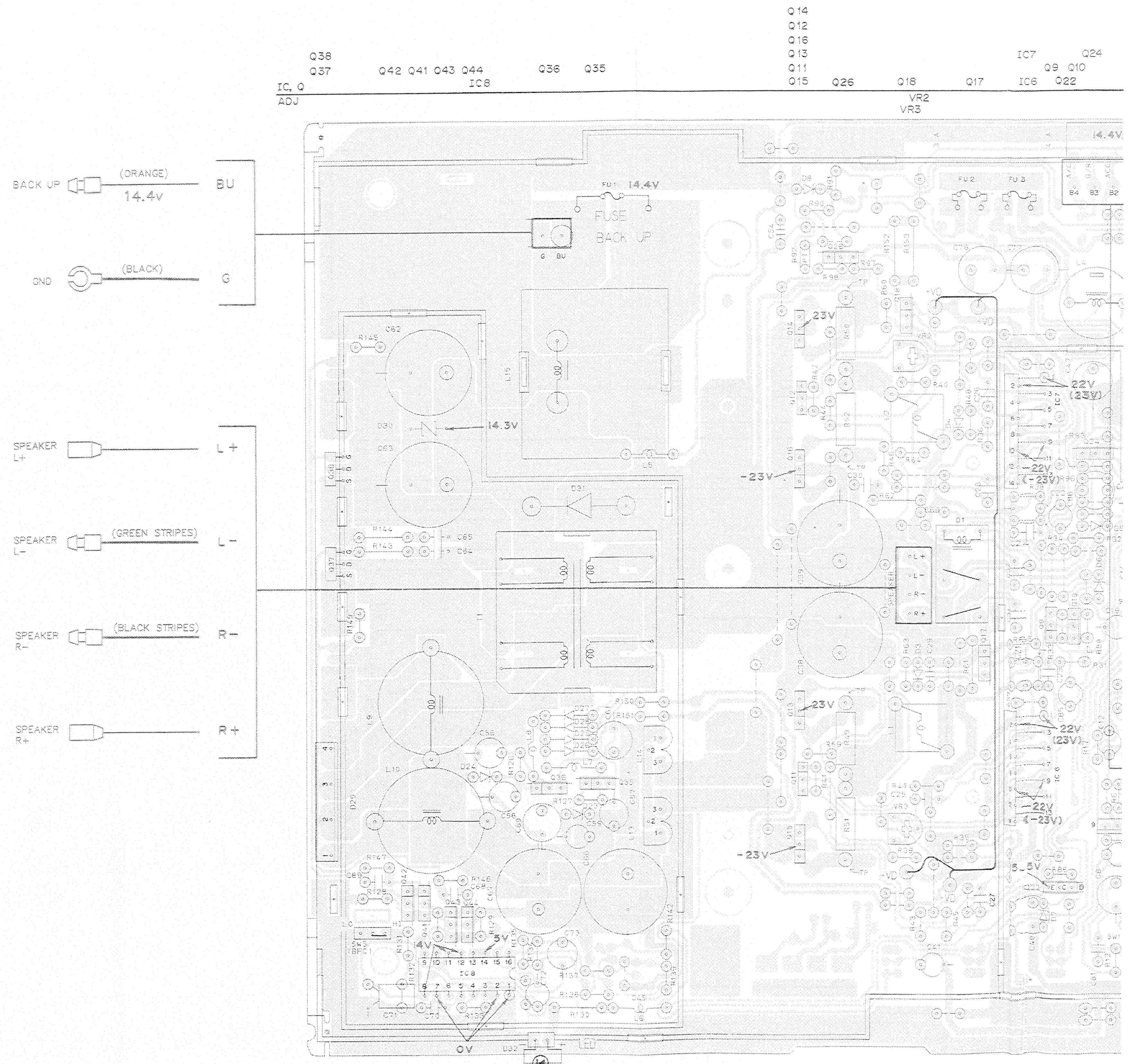
The underlined indicates the switch positon.

Fig. 27

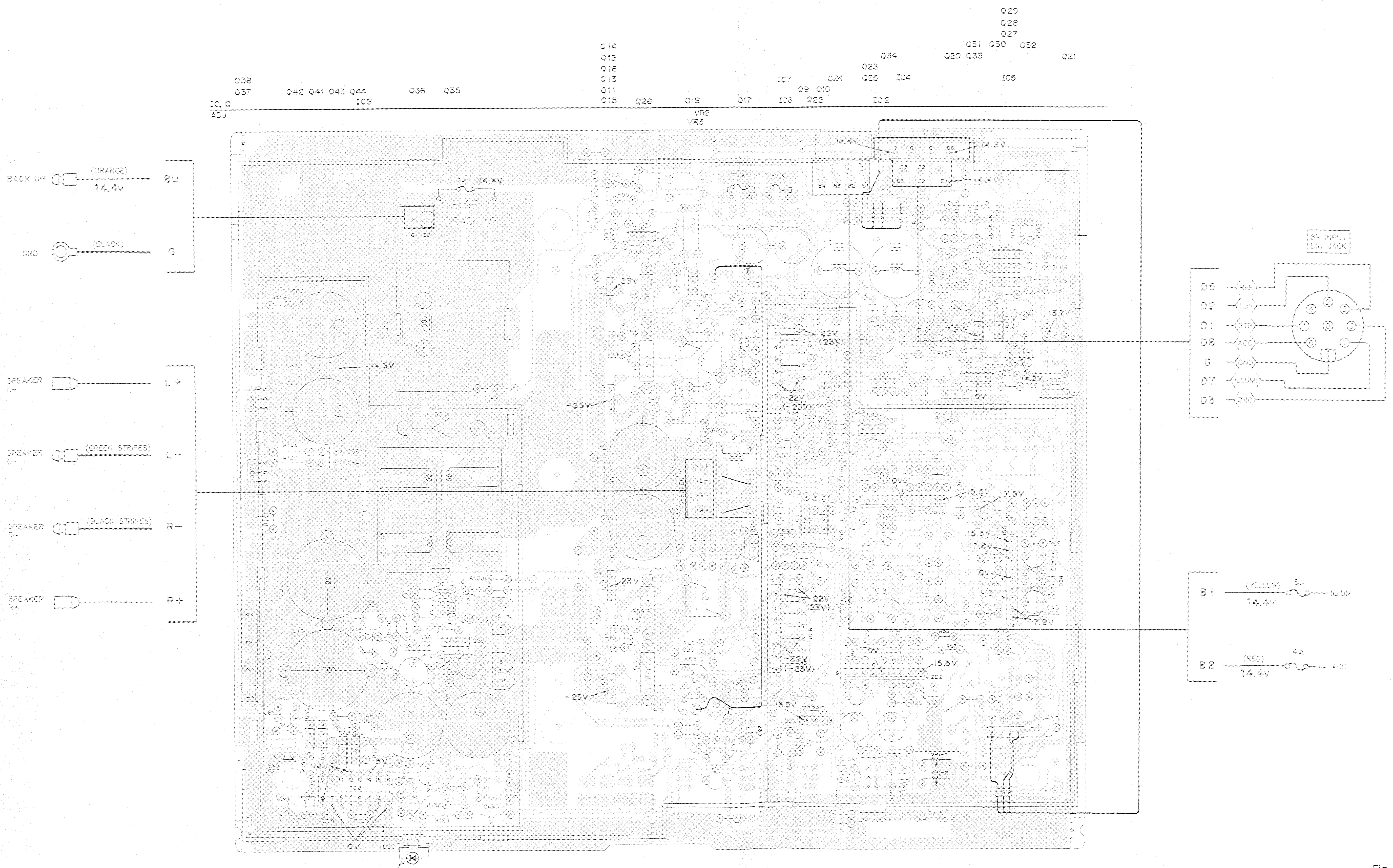
4 5 6 7 8 9

15. CONNECTION DIAGRAM (GM-1000/EW)

Pattern symbol	Schematic symbol	Representation	Remarks
		Transistor	Transistor E comes in square ⊡ , then to left C and B follow unless otherwise indicated.
		FET	
		Thyristor	
		Posistor	
		Electrolytic capacitor (polarized)	In case of polarized electrolytic capacitor, terminal marked ⊙ indicates +.
		Electrolytic capacitor (polarized)	
		Electrolytic capacitor (nonpolarized)	
		Capacitor	
		Resistor	
		Filter	
		Semi-fixed resistor	
		Jumper	


BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
SPEAKER L+
L+
SPEAKER L−
(GREEN STRIPES)
L−
SPEAKER R−
(BLACK STRIPES)
R−
SPEAKER R+
R+
IC, Q
ADJ
Q38
Q37
Q42 Q41 Q43 Q44
IC8
Q36
Q35
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
VR2
VR3
Q17
IC7
IC6
Q24
Q9 Q10
Q22
14.4V
FU1 14.4V
FUSE
BACK UP
14.3V
23V
−23V
22V
(23V)
22V
(−23V)
5.5V
14V
5V
0V
D31
D32
L15
L19
IC8

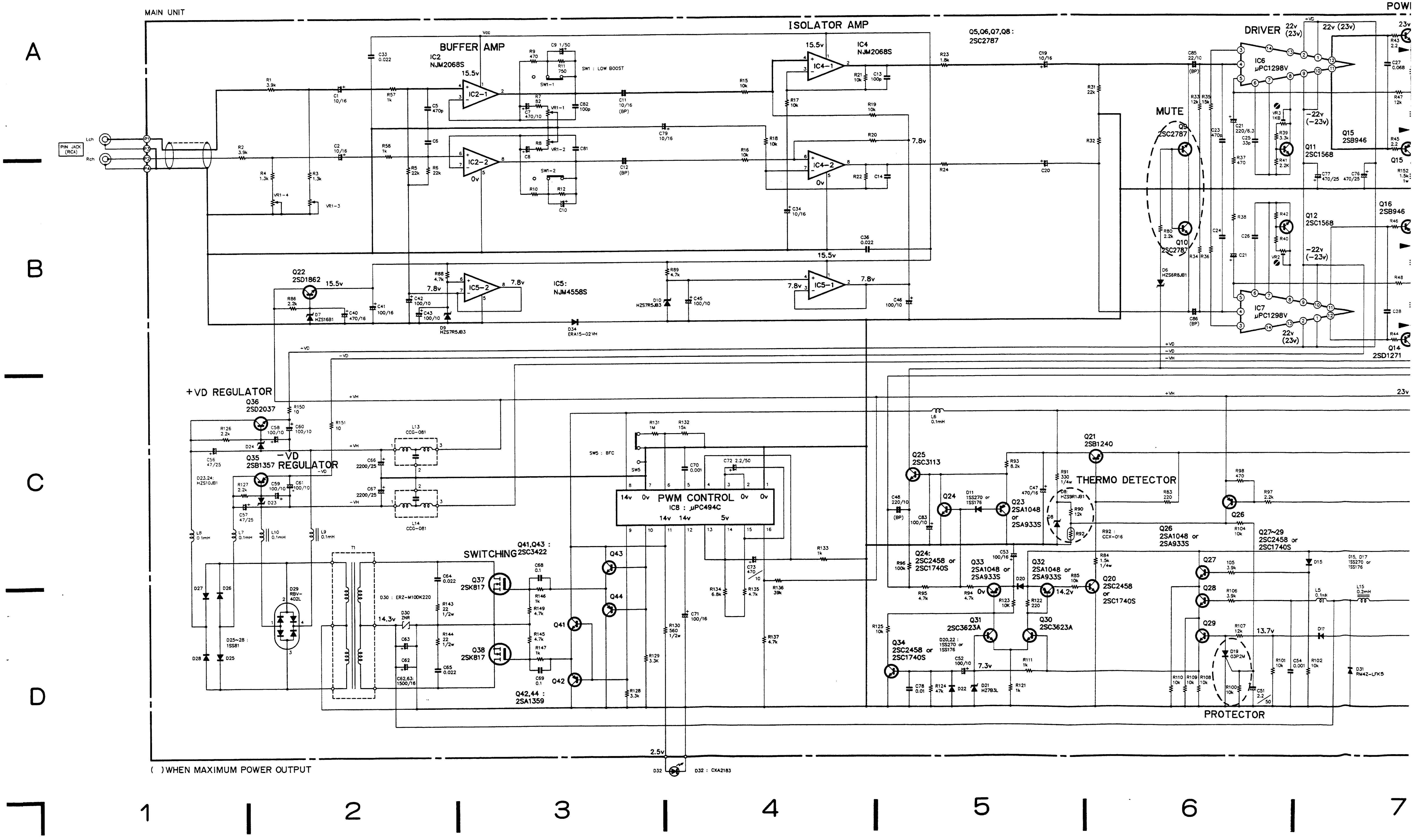
( ) WHEN MAXIMUM POWER OUTPUT

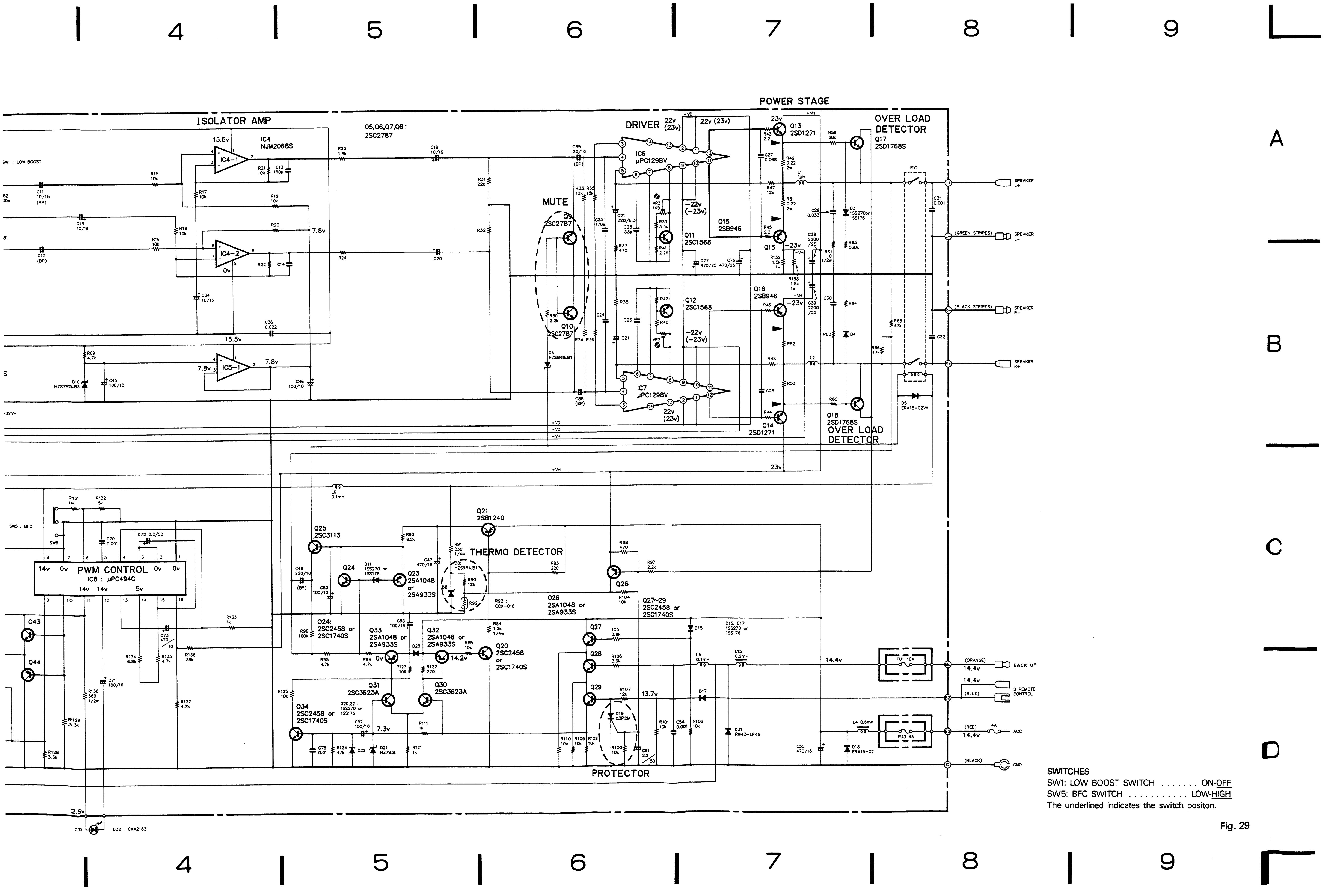

4
5
6
7
8
9
A
B
C
D
IC, Q
ADJ
Q38
Q37
Q42 Q41 Q43 Q44
IC8
Q36 Q35
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
VR2
VR3
Q17
IC7
IC6
Q9 Q10
Q22
Q24
Q23
Q25
Q34
IC4
IC2
Q29
Q28
Q27
Q31 Q30 Q32
Q20 Q33
Q21
IC5
BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
FU1 14.4V
FUSE
BACK UP
SPEAKER L+
L+
SPEAKER L–
(GREEN STRIPES)
L–
SPEAKER R–
(BLACK STRIPES)
R–
SPEAKER R+
R+
14.3V
23V
–23V
22V
(23V)
–22V
(–23V)
14.4V
14.3V
13.7V
7.3V
14.2V
0V
15.5V
7.8V
5V
14V
LED
LOW BOOST
GAIN
INPUT LEVEL
8P INPUT
DIN JACK
D5 (Rch)
D2 (Lch)
D1 (BTB)
D6 (ACC)
G (GND)
D7 (ILLUMI)
D3 (GND)
B1 (YELLOW) 3A
14.4V
ILLUMI
B2 (RED) 4A
14.4V
ACC

( ) WHEN MAXIMUM POWER OUTPUT

Fig. 28

16. SCHEMATIC CIRCUIT DIAGRAM (GM-1000/UC)

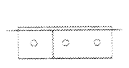
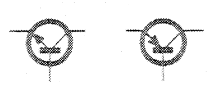
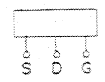
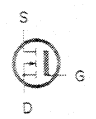
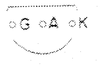
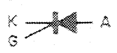
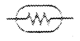
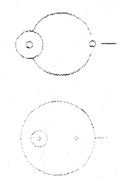
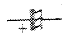
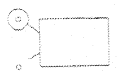
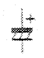
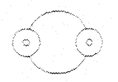
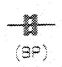
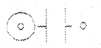
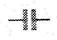
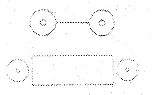
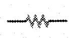
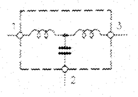
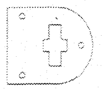
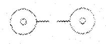

1
2
3
4
5
6
7
A
B
C
D
MAIN UNIT
BUFFER AMP
IC2 NJM2068S
ISOLATOR AMP
IC4 NJM2068S
Q5,Q6,Q7,Q8 : 2SC2787
DRIVER
IC6 μPC1298V
IC7 μPC1298V
MUTE
Q9 2SC2787
Q10 2SC2787
Q11 2SC1568
Q12 2SC1568
Q15 2SB946
Q16 2SB946
Q14 2SD1271
IC5: NJM4558S
Q22 2SD1862
SW1 : LOW BOOST
PIN JACK (RCA)
Lch
Rch
+VD REGULATOR
Q36 2SD2037
Q35 2SB1357
-VD REGULATOR
L13 CCG-081
L14 CCG-081
SW5 : BFC
PWM CONTROL
IC8 : μPC494C
SWITCHING
Q41,Q43 : 2SC3422
Q42,44 : 2SA1359
Q37 2SK817
Q38 2SK817
D30 : ERZ-M10DK220
D29 RBV-402L
D23,24: HZS10JB1
D25~28 : 1SS81
Q21 2SB1240
Q25 2SC3113
THERMO DETECTOR
R92 : CCX-016
Q23 2SA1048 or 2SA933S
Q24: 2SC2458 or 2SC1740S
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
Q32 2SA1048 or 2SA933S
Q33 2SA1048 or 2SA933S
Q20 2SC2458 or 2SC1740S
Q31 2SC3623A
Q30 2SC3623A
Q34 2SC2458 or 2SC1740S
D19 03P2M
D31 RM42-LFK5
PROTECTOR
D32 : CXA2183
( ) WHEN MAXIMUM POWER OUTPUT

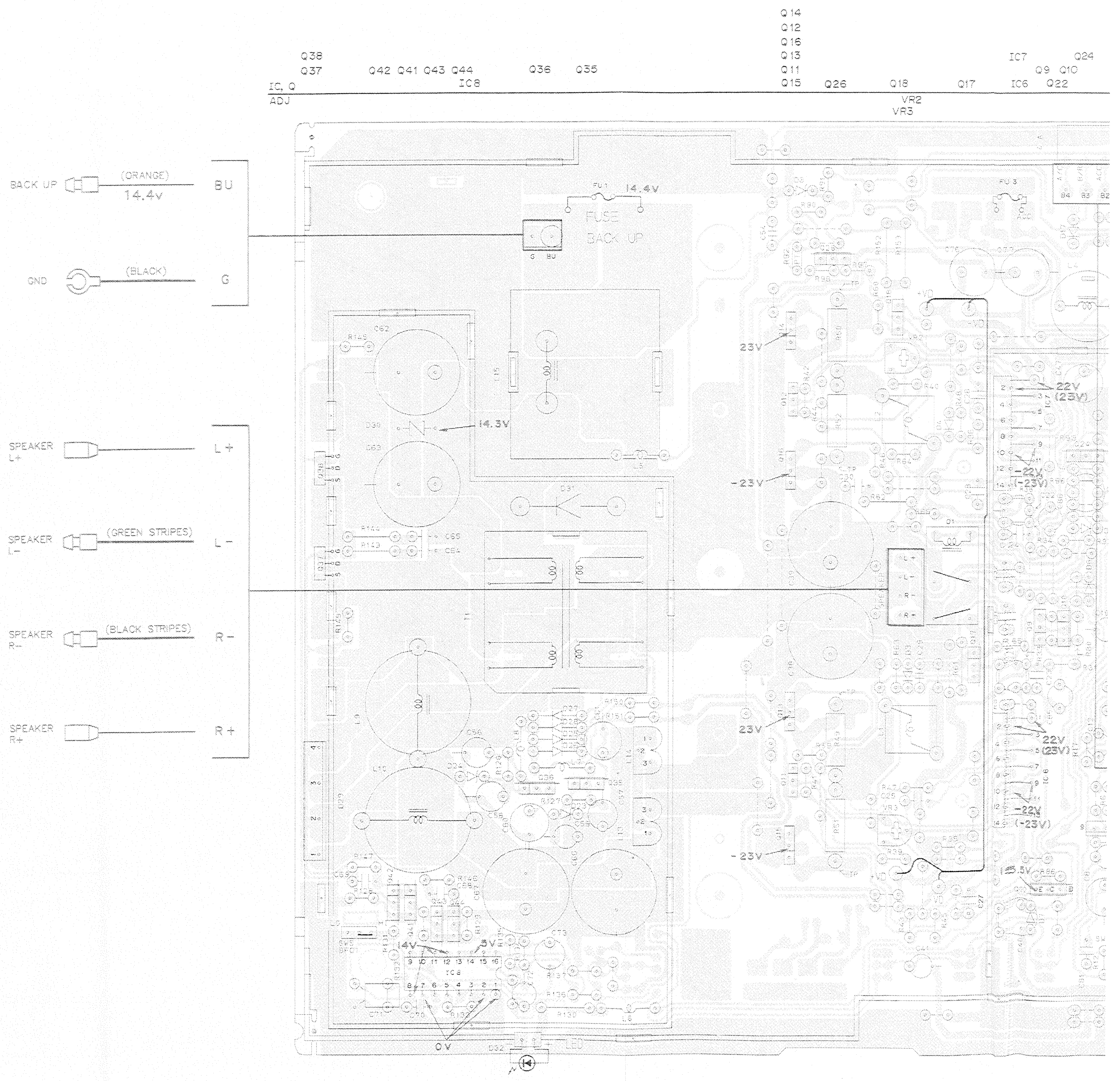

4
5
6
7
8
9
A
B
C
D
ISOLATOR AMP
SW1 : LOW BOOST
IC4 NJM2068S
IC4-1
IC4-2
IC5-1
15.5v
7.8v
0v
Q5,Q6,Q7,Q8 : 2SC2787
POWER STAGE
DRIVER
22v (23v)
IC6 μPC1298V
IC7 μPC1298V
-22v (-23v)
MUTE
Q9 2SC2787
Q10 2SC2787
D6 HZS6R8JB1
Q11 2SC1568
Q12 2SC1568
Q13 2SD1271
Q14 2SD1271
Q15 2SB946
Q16 2SB946
23v
-23v
OVER LOAD DETECTOR
Q17 2SD1768S
Q18 2SD1768S
RY1
D5 ERA15-02VH
SPEAKER L+
(GREEN STRIPES)
SPEAKER L-
(BLACK STRIPES)
SPEAKER R-
SPEAKER R+
+VD
-VD
-VH
+VH
D10 HZS7R5JB3
SW5 : BFC
SW5
PWM CONTROL
IC8 : μPC494C
14v
5v
Q21 2SB1240
Q25 2SC3113
Q24
Q23 2SA1048 or 2SA933S
THERMO DETECTOR
D8: HZS9R1JB1
R92 : CCX-016
Q26
Q26 2SA1048 or 2SA933S
Q27~29 2SC2458 or 2SC1740S
Q24: 2SC2458 or 2SC1740S
Q33 2SA1048 or 2SA933S
Q32 2SA1048 or 2SA933S
Q20 2SC2458 or 2SC1740S
Q31 2SC3623A
Q30 2SC3623A
Q34 2SC2458 or 2SC1740S
D20,22 : 1SS270 or 1SS176
D21 HZ7B3L
Q27
Q28
Q29
D19 03P2M
D15, D17 1SS270 or 1SS176
D31 RM4Z-LFK5
D13 ERA15-02
14.2v
13.7v
7.3v
14.4v
FU1 10A
FU3 4A
L4 0.6mH
(ORANGE)
BACK UP
(BLUE)
B REMOTE CONTROL
(RED)
ACC
(BLACK)
GND
PROTECTOR
Q43
Q44
2.5v
D32 : CXA2183

SWITCHES
SW1: LOW BOOST SWITCH .... ON-OFF
SW5: BFC SWITCH .... LOW-HIGH
The underlined indicates the switch positon.

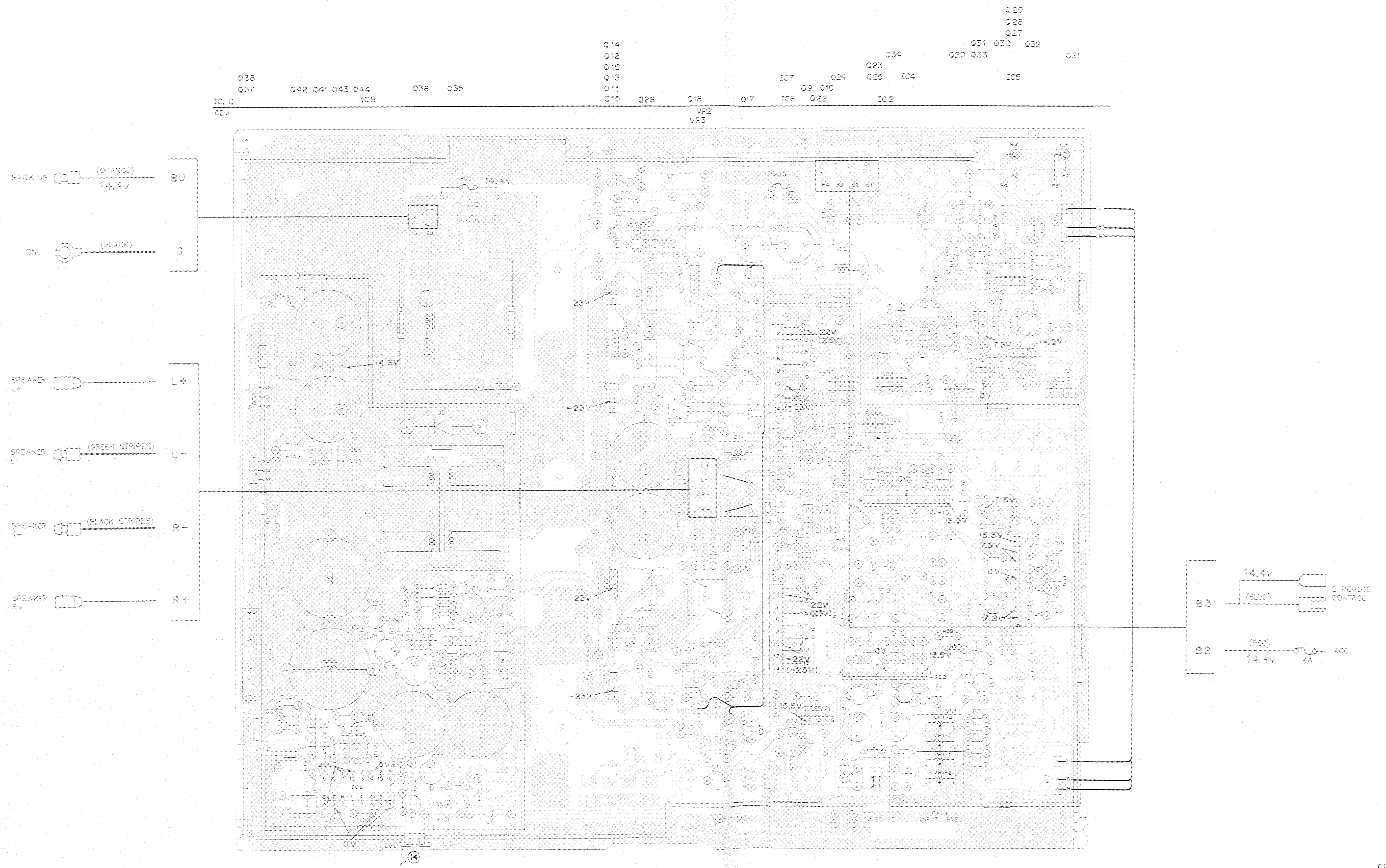
Fig. 29

17. CONNECTION DIAGRAM (GM-1000/UC)

Pattern symbol	Schematic symbol	Representation	Remarks
		Transistor	Transistor E comes in square ◻, then to left C and B follow unless otherwise indicated.
		FET	
		Thyristor	
		Posistor	
		Electrolytic capacitor (polarized)	In case of polarized electrolytic capacitor, terminal marked ◎ indicates +.
		Electrolytic capacitor (polarized)	
		Electrolytic capacitor (nonpolarized)	
		Capacitor	
		Resistor	
		Filter	
		Semi-fixed resistor	
		Jumper	


Q38
Q37
IC, Q
ADJ
Q42 Q41 Q43 Q44
IC8
Q36 Q35
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
VR2
VR3
Q17
IC7
Q9 Q10
IC6 Q22
Q24
BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
FU1 14.4V
FUSE
BACK UP
SPEAKER L+
L+
SPEAKER L−
(GREEN STRIPES)
L−
SPEAKER R−
(BLACK STRIPES)
R−
SPEAKER R+
R+
14.3V
23V
−23V
22V (23V)
−22V (−23V)
23V
−23V
22V (23V)
−22V (−23V)
15.5V
14V
5V
IC8
0V
D32
LED

( ) WHEN MAXIMUM POWER OUTPUT

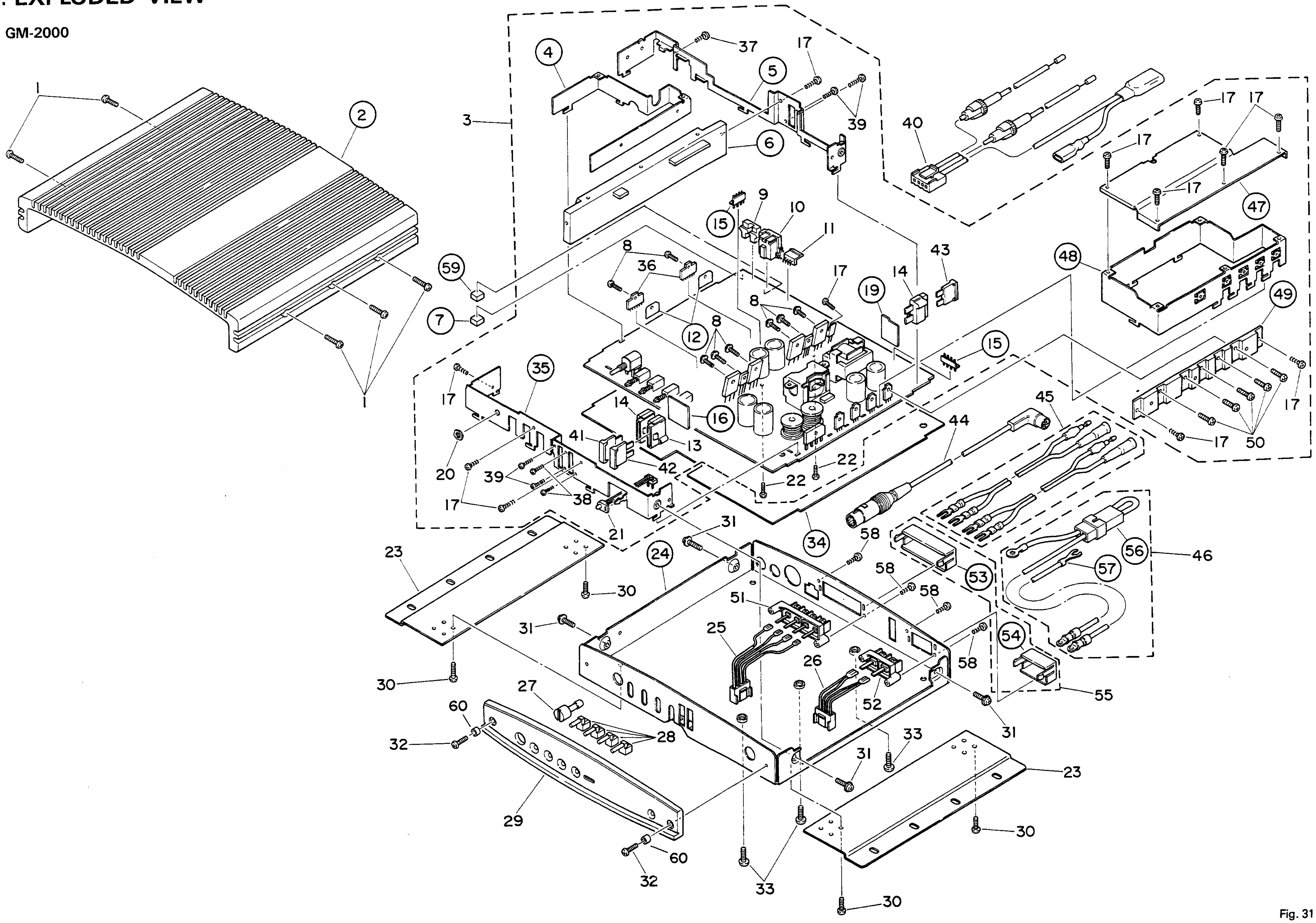

IC, Q
ADJ
Q38
Q37
Q42 Q41 Q43 Q44
IC8
Q36 Q35
Q14
Q12
Q16
Q13
Q11
Q15
Q26
Q18
VR2
VR3
Q17
IC7
IC6
Q9 Q10
Q22
Q24
Q23
Q25
IC2
Q34
IC4
Q20 Q33
Q31 Q30
Q29
Q28
Q27
Q32
IC5
Q21
BACK UP
(ORANGE)
14.4V
BU
GND
(BLACK)
G
FU1 14.4V
FUSE
BACK UP
SPEAKER L+
L+
SPEAKER L−
(GREEN STRIPES)
L−
SPEAKER R−
(BLACK STRIPES)
R−
SPEAKER R+
R+
14.3V
23V
−23V
22V (23V)
−22V (−23V)
7.3V
14.2V
0V
7.8V
15.5V
14V
5V
IC8
D32
LED
LOW BOOST
GAIN
INPUT LEVEL
Rch
Lch
E4 B3 B2 B1
RCA
14.4V
B REMOTE CONTROL
B3
(BLUE)
B2
(RED)
14.4V
4A
ACC
A
B
C
D

( ) WHEN MAXIMUM POWER OUTPUT

Fig. 30

18. EXPLODED VIEW

18.1 GM-2000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1 2 3 4 5 6
A B C D

Fig. 31

NOTE:

- *For your Parts S*
  ★ ★ and ★.
  ★ ★: GENERA
  This classificatio
  number, temper
- *Parts whose par*
- *Parts marked by*
  longer than usu

● Parts List

Mark	No.	Pa
	1	AM
	2	
◉	3	CW
◉		CW
◉		CW
	4	
	5	
	6	
	7	
	8	PM
	9	CK
	10	CK
	11	CK
	12	
	13	CK
	14	CK
	15	
	16	
	17	BM
	18	··
	19	
	20	CB
★	21	CX
	22	BM
	23	CN
	24	
	25	CD
★	26	CD
★	27	CA
★	28	CA
	29	CX
		CX

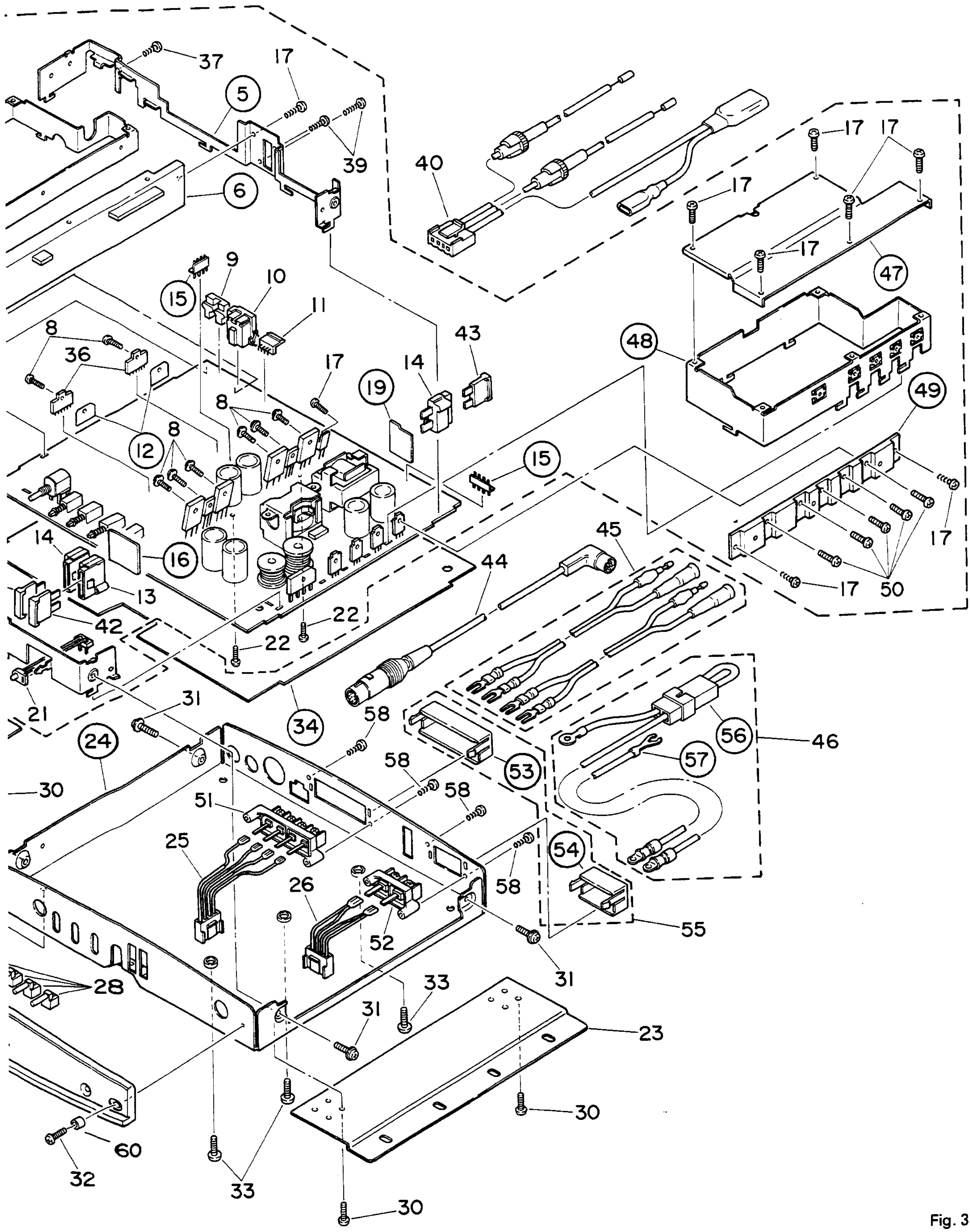


Fig. 31

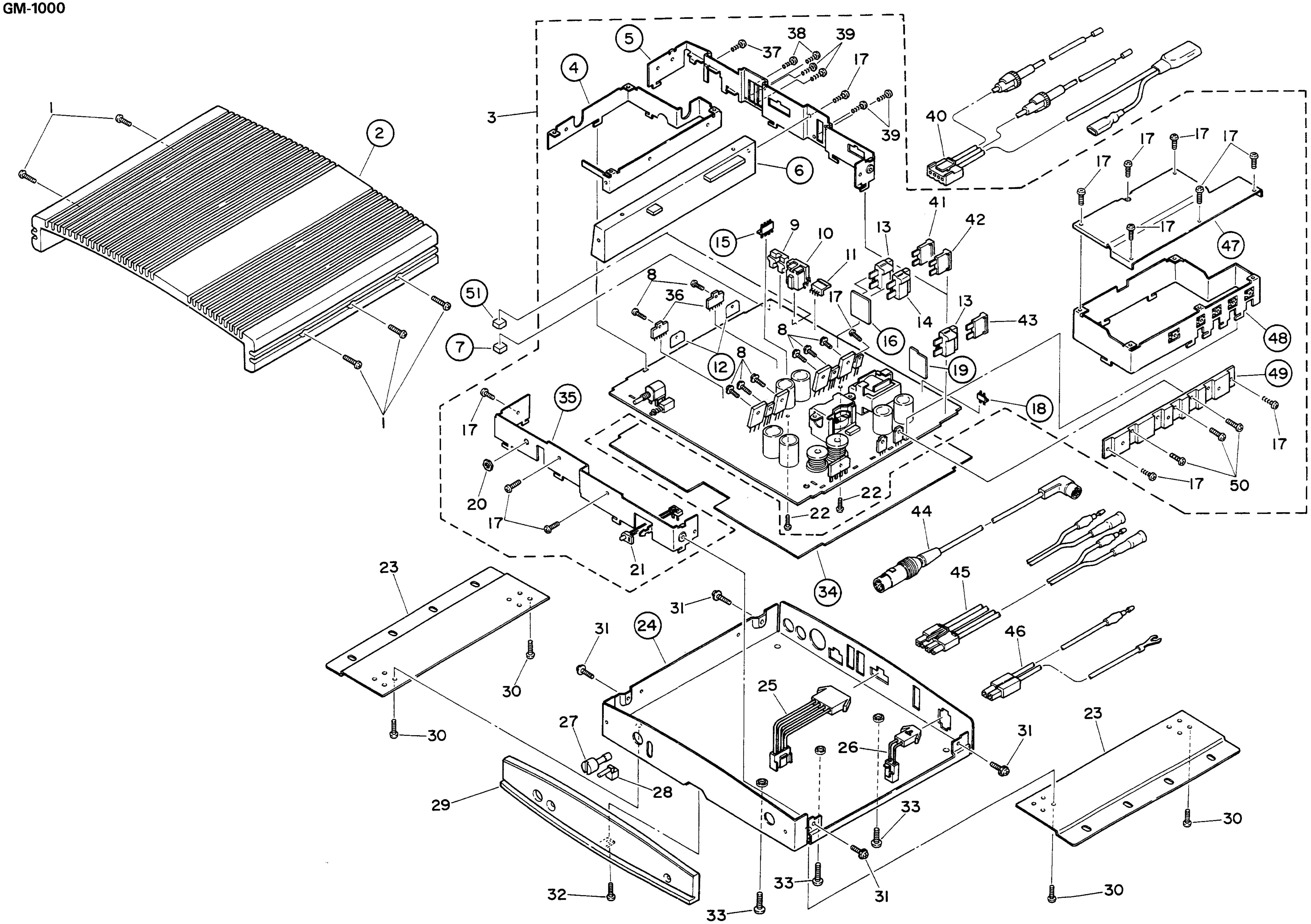
NOTE:

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.*
  ★ ★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

● Parts List

Mark	No.	Part No.	Description
	1	AMZ30P080FZK	Screw
	2		Heat Sink Assy(ES, EW)
			Heat Sink Assy(UC)
◉	3	CWM1640	Main Unit(ES)
◉		CWM1639	Main Unit(UC)
◉		CWM1641	Main Unit(EW)
	4		Shield
★★	5		Bracket
	6		Heat Sink
	7		Cushion
	8	PMF30P100FMC	Screw
★	9	CKS1466	Pin Jack(ES, UC)
★	10	CKS1156	Connector(ES, EW)
★	11	CKS1340	Connector(4P)
★★	12		Rubber
★★	13	CKR1001	Fuse Holder(ES, EW)
★★	14	CKR1001	Fuse Holder
	15		Plug(4P)
	16		P.C.Board
★	17	BMZ30P050FMC	Screw
	18	·····	
	19		P.C.Board
	20	CBN-032	Nut
★	21	CXA2183	LED Assy
	22	BMZ30P060FMC	Screw
	23	CNC2099	Bracket
	24		Case(ES)
			Case(UC)
			Case(EW)
	25	CDE2028	Cord(4P)
★	26	CDE2030	Cord(4P)
★	27	CAA1135	Knob
★	28	CAC1701	Button
	29	CXA2378	Grille Assy(ES)
		CXA2423	Grille Assy(UC)
		CXA2415	Grille Assy(EW)
	30	BMZ50P060FZK	Screw
	31	BMZ30P050FMC	Screw
	32	BMZ30P080FZK	Screw
	33	BMZ40P080FMC	Screw
	34		Insulator
	35		Bracket
★★	36	μPC1298V	IC
	37	BMZ20P080FMC	Screw(ES, EW)
	38	PTZ20P080FMC	Screw(ES, EW)
	39	PTZ20P080FMC	Screw
★	40	CDE2106	Cord Assy(ES)
★		CDE2107	Cord Assy(UC)
★		CDE2105	Cord Assy(EW)
★★	41	CEK1001	Fuse(4A)
★★	42	CEK1134	Fuse(3A)(ES, EW)
★★	43	CEK1137	Fuse(15A)
	44	CDE1846	DIN Connector(EW)
	45	CDE2018	Cord
★	46	CDE1997	Cord Assy(ES, UC, EW)
	47		Shield
	48		Shield
	49		Heat Sink
	50	BMZ26P080FMC	Screw
	51	CKE1004	4P Terminal
	52	CKE1007	2P Terminal
	53		Cover
	54		Cover
	55	CEA1345	Cover Assy
	56		Cord
	57		Cord
	58	BTZ30P080FZK	Screw
	59		Cushion
	60	CNC2375	Collar

18.2 GM-1000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A
B
C
D

Fig. 32

- Parts List

Mark	No.	Part No.	Description
	1	AMZ30P120FZK	Screw
	2		Heat Sink Assy(ES,EW)
			Heat Sink Assy(UC)
◉	3	CWM1644	Main Unit(ES)
◉		CWM1643	Main Unit(UC)
◉		CWM1645	Main Unit(EW)
	4		Shield
	5		Bracket
	6		Heat Sink
	7		Cushion
	8	PMF30P080FMC	Screw
	9	CKS1466	Pin Jack(ES,UC)
	10	CKS1156	Connector(ES,EW)
	11	CKS1340	Connector(4P)
	12		Rubber
	13	CKR1001	Fuse Holder
	14	CKR1001	Fuse Holder(ES,EW)
	15		Plug(4P)
	16		P.C.Board
	17	BMZ30P050FMC	Screw
	18		Plug(2P)
	19		P.C.Board
	20	CBN-032	Nut
★	21	CXA2183	LED Assy
	22	BMZ30P060FMC	Screw
	23	CNC2099	Bracket
	24		Case(ES)
			Case(UC)
			Case(EW)
	25	CDE1839	Cord(4P)
★	26	CDE1885	Cord(4P)
★	27	CAA1135	Knob
★	28	CAC1701	Button
	29	CXA2379	Grille Assy(ES,UC)
		CXA2417	Grille Assy(UC)
	30	BMZ50P060FZK	Screw
	31	BMZ30P050FMC	Screw
	32	BMZ30P050FZK	Screw
	33	BMZ40P080FMC	Screw
	34		Insulator
	35		Bracket
★★	36	μPC1298V	IC
	37	BMZ20P080FMC	Screw(ES,EW)
	38	PTZ20P080FMC	Screw(ES,EW)
	39	PTZ20P080FMC	Screw
★	40	CDE2110	Cord Assy(ES)
		CDE2111	Cord Assy(UC)
		CDE2109	Cord Assy(EW)
★★	41	CEK1001	Fuse(4A)
★★	42	CEK1134	Fuse(3A)(ES,EW)
★★	43	CEK1136	Fuse(10A)
	44	CDE1847	DIN Connector(EW)
	45	CDE1836	Cord
★	46	CDE1840	Cord Assy(ES,UC,EW)
	47		Shield
	48		Shield
	49		Heat Sink
	50	BMZ26P080FMC	Screw
	51		Cushion

19. ELECTRICAL PARTS LIST

NOTE:

- *For your Parts Stock Control, the fast moving items are indicated with the marks ‡‡ and ‡.*
  ‡‡ : GENERALLY MOVES FASTER THAN ‡.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*
  Chip Resistor
  RS1/8S □□□J
  Chip Capacitor (except for CQS.....)
  CKS....., CCS.....

Model Number : GM-2000/ES UC EW

Unit Number :
Unit Name : Main unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
‡‡	IC 1	(ES)	TC4066BP
‡‡	IC 2 4		NJM2068S
‡‡	IC 3		TC4066BP
‡‡	IC 5		NJM4558S
‡‡	IC 6 7		μPC1298V
‡‡	IC 8		μPC494C
‡‡	Q 1 2	(ES)	2SC2458 (2SC1740S)
‡‡	Q 3 4 20 24 27 28 29 34 45 46		2SC2458 (2SC1740S)
‡‡	Q 5 6 7 8 9 10		2SC2787
‡‡	Q 11 12		2SC1568
‡‡	Q 13 14		2SD1704
‡‡	Q 15 16		2SB1154
‡‡	Q 17 18		2SD1768S
‡‡	Q 23 26 32 33		2SA1048 (2SA933S)
‡‡	Q 21		2SB1240
‡‡	Q 22		2SD2037
‡‡	Q 25		2SC3113
‡‡	Q 30 31		2SC3623A
‡‡	Q 35		2SB1357
‡‡	Q 36		2SD2037
‡‡	Q 37 38 39 40		2SK817
‡‡	Q 41 43		2SC3422
‡‡	Q 42 44		2SA1359
‡	D 1 2 3 4 11 15 20 22		1SS176 (US1040M) (1SS270)
‡	D 5 13 34		ERA15-02VH
‡	D 6		HZS6R8JB1 (RD6R8JSB1)
‡	D 7		HZS9R1JB1 (RD9R1JSB1)
‡	D 8		HZS9R1JB1 (RD9R1JSB1)
‡	D 9 10		HZS4R7EB2 (RD4R5ESB2)
‡	D 12	(ES EW)	ERA15-02VH
‡	D 16	(EW)	1SS176 (US1040M) (1SS270)
‡	D 16 17 33	(ES)	1SS176 (US1040M) (1SS270)
‡	D 17	(UC)	1SS176 (US1040M) (1SS270)
‡	D 19	Thyristor	03P2M
‡	D 21		HZ7B3L
‡	D 23 24		HZS4R3EB1 (RD4R3ESB1)
‡	D 25 26 27 28		1SS81
‡	D 29		RBV-402L
‡	D 30	Serge Absorber	ERZ-M10DK220
‡	D 31		RM4Z-LFK5
‡	D 32	LED Assy	CXA2183
	L 1 2	Coil	CTH1028
	L 3	Choke Coil(ES EW)	CTH1048
	L 4	Choke Coil	CTH1048
	L 5	Ferri-Inductor	CTF-157
	L 6 7 8	Coil 100μH	CTF-113
	L 9 10	Choke Coil	CTH1036
	L 13 14		CCG-081
	L 15	Choke Coil	CTH1031
‡‡	SW 1 2 3 4	Switch	CSG1023
‡‡	SW 5	Switch	HSH-156
‡‡	VR 1	Volume 2kΩ(C)×2, 3kΩ(A)×2 (ES UC)	CCS1095
‡‡	VR 1	Volume 2kΩ(C)×2 (EV)	CCS1103
‡‡	VR 2 3	Semi-fixed	VRTB6VS102

Mark	Circuit Symbol & No.	Part Name	Part No.
	RY 1	Relay	CSR1010
	T 1	Transformer	CTT1004
**	FU 1	Fuse 15A	CEK1137
**	FU 2	Fuse 3A (ES EW)	CEK1134
**	FU 3	Fuse 4A	CEK1001

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
	R 1 2	(ES UC)	RD1/4PS392JL
	R 3 4	(ES UC)	RD1/4PS132JL
	R 5 6 31 32		RD1/4PS223JL
	R 7 8		RD1/4PS820JL
	R 9 10 37 38 98		RD1/4PS471JL
	R 11 12		RD1/4PS751JL
	R 13 14 71 72		RD1/4PS152JL
	R 15 16 18 93		RD1/4PS822JL
	R 17 19 20 21 22		RD1/4PS103JL
	R 23 24 27 28		RD1/4PS821JL
	R 25 26 29 30		RD1/4PS104JL
	R 33 34 47 48		RD1/4PS153JL
	R 35 36		RD1/4PS153JL
	R 39 40		RD1/4PS332JL
	R 41 42 97 126 127		RD1/4PS222JL
	R 43 44 45 46		RD1/4PS2R2JL
	R 49 50 51 52	0.22Ω/2W	CCN1013
	R 53 54 55 56 61 62		RS1/2P100JL
	R 57 58 111 121 133 146 147		RD1/4PS102JL
	R 59 60 136		RD1/4PS393JL
	R 63 64		RD1/4PS564JL
	R 65 66		RD1/4PS473JL
	R 67	(ES)	RD1/4PS223JL
	R 68	(ES)	RD1/4PS103JL
	R 69 70	(ES)	RD1/4PS222JL
	R 73		RD1/4PS223JL
	R 75		RD1/4PS473JL
	R 76 77		RD1/4PS222JL
	R 78 139 142		RD1/4PS103JL
	R 79		RD1/4PM102J
	R 80		RD1/4PS222JL
	R 83 122		RD1/4PS221JL
	R 84		RD1/4PS152JL
	R 85 100 101 102 104 108		RD1/4PS103JL
	R 86		RD1/4PS472JL
	R 88 89		RD1/4PS102JL
	R 90		RD1/4PS123JL
	R 91		RD1/4PS331JL
	R 92	Posister	CCX-016
	R 94 95 135 145 149		RD1/4PS472JL
	R 96		RD1/4PS104JL
	R 99	(ES EW)	RD1/4PS152JL
	R 105 106		RD1/4PS392JL
	R 107		RD1/4PS123JL
	R 109 110 123 125		RD1/4PS103JL
	R 124		RD1/4PS473JL
	R 128 129		RD1/4PS332JL
	R 130		RS1/2P561JL
	R 131		RN1/4PC1004D
	R 132		RN1/4PC1502D
	R 134		RD1/4PS682JL
	R 136		RD1/4PS223JL
	R 137		RD1/4PS222JL
	R 138		RD1/4PS561JL
	R 140		RD1/4PS242JL
	R 141		RD1/4PS432JL
	R 143 144		RS1/2P220JL
	R 148		RD1/4PS681JL
	R 150 151		RD1/4PS330JL
	R 152 153		RS1P152JL
	R 154 155		RD1/4PS220JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
	C 1 2	(ES UC)	CEKA100M16
	C 3 4	(ES EW)	CEKA100M16
	C 5 6 23 24		CKCYB471K50
	C 7 8		CEA471M10L2
	C 9 10 15 16 17 18		CEA010M50L2
	C 11 12	10μF/16V	CCH1034
	C 13 14		CCCCH101J50
	C 19 20		CEKA100M16
	C 21 22		CEA221M6R3L2
	C 25 26		CCCCH330J50
	C 27 28		CQMA683K50
	C 29 30		CQMA333K50
	C 31 32 74 75		CQMA102K50
	C 33 36 64 65		CQMA223K50
	C 34 79		CEA100M16L2
	C 35		CEA4R7M25L2
	C 37		CEA220M16L2
	C 38 39	2200μF/35V	CCH1028
	C 40		CEA471M10L2
	C 41		CEA101M10L2
	C 42 43 45 46		CEA101M10L2
	C 47 50	470μF/16V	CCH-114
	C 48		CEA221M10NPLL
	C 49	470μF/16V(ES EW)	CCH-114
	C 51		CEA2R2M50L2
	C 52		CEA101M10L2
	C 53		CEA101M16L2
	C 54		CKPYB102K50L
	C 56 57		CEAUH470M25
	C 58 59 60 61		CEAUH101M10
	C 62 63	3300μF/16V	CCH1023
	C 66 67	2200μF/35V	CCH1024
	C 68 69		CQMA104K50
	C 70		CQPA102J2A
	C 71		CEAUH101M16
	C 72		CEAUH2R2M50
	C 73		CEHAQ471M10
	C 80	(ES)	CEA100M16L2
	C 76 77		CEA471M35L2
	C 78		CQMA103K50
	C 81 82		CCCCH101J50
	C 83		CEA101M10L2
	C 85 86	22μF/10V	CCH1035
	C 87	(ES EW)	CQMA103K50

Model Number : GM-1000/ES UC EW

Unit Number :
Unit Name : Main unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
**	IC 1	(ES)	TC4066BP
**	IC 2 4		NJM2068S
**	IC 5		NJM4558S
**	IC 6 7		μPC1298V
**	IC 8		μPC494C
**	Q 1 2	(ES)	2SC2458 (2SC1740S)
**	Q 9 10		2SC2787
**	Q 11 12		2SC1568
**	Q 13 14		2SD1271
**	Q 15 16		2SB946
**	Q 17 18		2SD1768S
**	Q 23 26 32 33		2SA1048 (2SA933S)
**	Q 20 24 27 28 29 34		2SC2458 (2SC1740S)
**	Q 21		2SB1240
**	Q 22		2SD1862
**	Q 25		2SC3113
**	Q 30 31		2SC3623A
**	Q 35		2SB1357
**	Q 36		2SD2037
**	Q 37 38		2SK817
**	Q 41 43		2SC3422
**	Q 42 44		2SA1359
*	D 3 4 11 15 20 22		1SS176 (US1040M) (1SS270)
*	D 5 13 34		ERA15-02VH
*	D 6		HZS6R8JB1 (RD6R8JSB1)
*	D 7		HZS16JB1 (RD16JSB1)
*	D 8		HZS9R1JB1 (RD9R1JSB1)
*	D 9 10		HZS7R5JB3 (RD7R5JSB3)
*	D 12	(ES EW)	ERA15-02VH
*	D 16	(EW)	1SS176 (US1040M) (1SS270)
*	D 16 17 33	(ES)	1SS176 (US1040M) (1SS270)
*	D 17	(UC)	1SS176 (US1040M) (1SS270)
*	D 19	Thyristor	03P2M
*	D 21		HZ7B3L
*	D 23 24		HZS10JB1 (RD10JSB1)
*	D 25 26 27 28		1SS81
*	D 29		RBV-402L
*	D 30	Serge Absorber	ERZ-M10DK220
*	D 31		RM4Z-LFK5
*	D 32	LED Assy	CXA2183
	L 1 2	Coil	CTH1028
	L 3	Choke Coil(ES EW)	CTH1048
	L 4	Choke Coil	CTH1048
	L 5	Ferri-Inductor	CTF-157
	L 6 7 8	Coil 100μH	CTF-113
	L 9 10	Choke Coil	CTH1034
	L 13 14		CCG-081
	L 15	Choke Coil	CTH1033
**	SW 1	Switch	CSG1023
**	SW 5	Switch	HSH-156
**	VR 1	Volume 2kΩ(C)×2, 3kΩ(A)×2 (ES UC)	CCS1095
**	VR 1	Volume 2kΩ(C)×2 (EW)	CCS1103
**	VR 2 3	Semi-fixed	VRTB6VS102
	RY 1	Relay	CSR1010
	T 1	Transformer	CTT1005
**	FU 1	Fuse 10A	CEK1136
**	FU 2	Fuse 3A (ES EW)	CEK1134
**	FU 3	Fuse 4A	CEK1001

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
	R 1 2	(ES UC)	RD1/4PS392JL
	R 3 4	(ES UC)	RD1/4PS132JL
	R 5 6 31 32		RD1/4PS223JL
	R 7 8		RD1/4PS820JL
	R 9 10 37 38 98		RD1/4PS471JL
	R 11 12		RD1/4PS751JL
	R 15 16 17 18 19 20 21 22		RD1/4PS103JL
	R 23 24		RD1/4PS182JL
	R 33 34 47 48 107		RD1/4PS123JL
	R 35 36		RD1/4PS153JL
	R 39 40 128 129		RD1/4PS332JL
	R 41 42 97 126 127		RD1/4PS222JL
	R 43 44 45 46		RD1/4PS2R2JL
	R 49 50 51 52	0.22Ω/2W	CCN1013
	R 57 58 111 121 133 146 147		RD1/4PS102JL
	R 59 60		RD1/4PS683JL
	R 61 62		RD1/4PM100J
	R 63 64		RD1/4PS564JL
	R 65 66		RD1/4PS473JL
	R 67	(ES)	RD1/4PS223JL
	R 68	(ES)	RD1/4PS103JL
	R 69 70	(ES)	RD1/4PS222JL
	R 80		RD1/4PS222JL
	R 83 122		RD1/4PS221JL
	R 84		RD1/4PS152JL

Mark	Circuit Symbol & No.	Part Name	Part No.
	R 85 100 101 102 104 108		RD1/4PS103JL
	R 86		RD1/4PS222JL
	R 88 89		RD1/4PS472JL
	R 90		RD1/4PS123JL
	R 91 150		RD1/4PS331JL
	R 92	Posister	CCX-016
	R 93		RD1/4PS822JL
	R 94 95 135 137 145 149		RD1/4PS472JL
	R 96		RD1/4PS104JL
	R 99	(ES EW)	RD1/4PS152JL
	R 105 106		RD1/4PS392JL
	R 109 110 123 125		RD1/4PS103JL
	R 124		RD1/4PS473JL
	R 130		RS1/2P561JL
	R 131		RN1/4PC1004D
	R 132		RN1/4PC1502D
	R 134		RD1/4PS682JL
	R 136		RD1/4PS393JL
	R 143 144		RS1/2P220JL
	R 150		RD1/4PS100JL
	R 151		RD1/4PS100JL
	R 152 153		RS1P152JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
	C 1 2	(ES UC)	CEKA100M16
	C 3 4	(ES EW)	CEKA100M16
	C 5 6 23. 24		CKCYB471K50
	C 7 8		CEA471M10L2
	C 9 10		CEA010M50L2
	C 11 12 19 20		CEKA100M16
	C 13 14		CCCCH101J50
	C 21 22		CEA221M6R3L2
	C 25 26		CCCCH330J50
	C 27 28		CQMA683K50
	C 29 30		CQMA333K50
	C 31 32		CQMA102K50
	C 33 36 64 65		CQMA223K50
	C 34 79		CEA100M16L2
	C 38 39	2200μF/25V	CCH1027
	C 40 47 50	470μF/16V	CCH-114
	C 41 53		CEA101M16L2
	C 42 43 45 46		CEA101M10L2
	C 48		CEA221M10NPLL
	C 49	470μF/16V(ES EW)	CCH-114
	C 51		CEA2R2M50L2
	C 52		CEA101M10L2
	C 54		CKPYB102K50L
	C 56 57		CEAUH470M25
	C 58 59 60 61		CEAUH101M10
	C 62 63	1500μF/16V	CCH1021
	C 66 67	2200μF/25V	CCH1022
	C 68 69		CQMA104K50
	C 70		CQPA102J2A
	C 71		CEAUH101M16
	C 72		CEAUH2R2M50
	C 73		CEHAQ471M10
	C 76 77		CEA471M25L2
	C 78		CQMA103K50
	C 80	(ES)	CEA100M16L2
	C 81 82		CCCCH101J50
	C 83		CEA101M10L2
	C 85 86	22μF/10V	CCH1035
	C 87	(ES EW)	CQMA103K50

20. PACKING METHOD

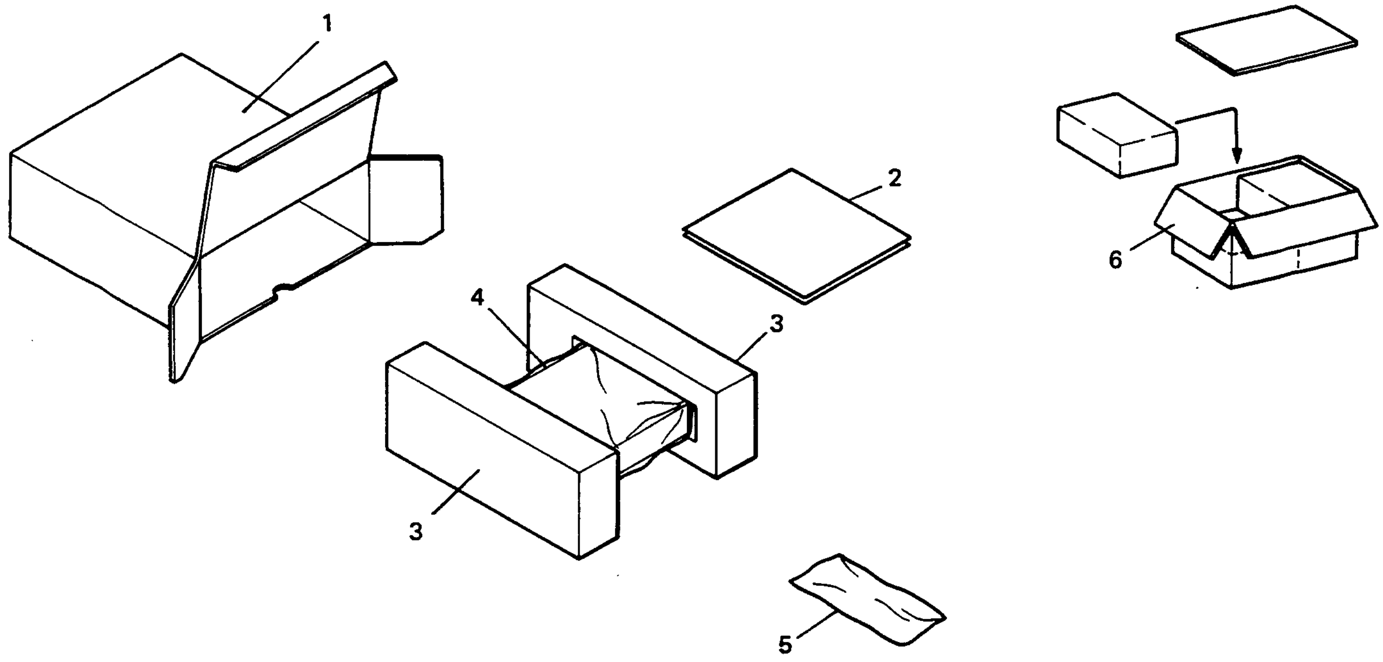

Fig. 33

●Parts List

Mark	No.	Part No.	Description
	1	CHG1469	Carton (GM-2000/ES)
		CHG1467	Carton (GM-2000/EW)
		CHG1468	Carton (GM-2000/UC)
		CHG1466	Carton (GM-1000/ES)
		CHG1464	Carton (GM-1000/EW)
		CHG1465	Carton (GM-1000/UC)
	2	CRD1203	Owner' s Manual (GM-2000/ES)
		CRD1200	Owner' s Manual (GM-1000/ES)
			(English , French , Spanish , Arabic)
		CRD1201	Owner' s Manual (GM-2000/EW)
		CRD1198	Owner' s Manual (GM-1000/EW)
			(English , French , German , Spanish , Swedish , Norwegian , Dutch , Italian)
		CRD1202	Owner' s Manual (GM-2000/UC)
		CRD1199	Owner' s Manual (GM-1000/UC)
			(English , French)
	3	CHP1138	Styrofoam (GM-2000)
		CHP1137	Styrofoam (GM-1000)
	4	CEG1042	Polyethylene Bag
	5	CEA1336	Accessory Assy (GM-2000ES)
		CEA1338	Accessory Assy (GM-2000EW)
		CEA1339	Accessory Assy (GM-2000UC)
		CEA1340	Accessory Assy (GM-1000ES)
		CEA1342	Accessory Assy (GM-1000EW)
		CEA1343	Accessory Assy (GM-1000UC)
	5-1	CDE2106	Cord (GM-2000/ES)
		CDE2105	Cord (GM-2000/EW)
		CDE2107	Cord (GM-2000/UC)
		CDE2110	Cord (GM-1000/ES)
		CDE2109	Cord (GM-1000/EW)
		CDE2111	Cord (GM-1000/UC)
	5-2	CDE1997	Cord Assy (GM-2000)
		CDE1840	Cord Assy (GM-1000)
	5-2-1		Cord (GM-2000)
	5-2-2		Cord (GM-2000)
	5-3	CDE2018	Cord (GM-2000)
		CDE1836	Cord (GM-1000)
	5-4	CDE1846	DIN Connector (GM-2000/EW)
		CDE1847	DIN Connector (GM-1000/EW)
	5-5		Screw Kit
	5-5-1	BMZ50P060FZK	Screw (×4)
	5-5-2	BTZ50P160FZK	Screw (×8)
	5-6	CEA1345	Cover Assy (GM-2000)
	5-6-1		Cover (GM-2000)
	5-6-2		Cover (GM-2000)
	5-7	CNC2099	Bracket(×2)
	6	CHL1468	Contain Box (GM-2000/UC)
		CHL1465	Contain Box (GM-1000/UC)